```
10578615
File   5:Biosis Previews(R) 1926-2008/Feb W4
       (c) 2008 The Thomson Corporation

      Set  Items  Description
      ---  -----  -----------
? s (glv operon)
      S1       1  (GLV OPERON)
? s glvA or glvR or glvC
               5  GLVA
              49  GLVR
               3  GLVC
      S2      55  GLVA OR GLVR OR GLVC
? s s2 and (knock)
              55  S2
            9104  KNOCK
      S3       0  S2 AND (KNOCK)
? s s2 and replace?
              55  S2
          197927  REPLACE?
      S4       0  S2 AND REPLACE?
? t s2/7/1-55

 2/7/1
DIALOG(R)File   5:Biosis Previews(R)
(c) 2008 The Thomson Corporation. All rts. reserv.

0019899363   BIOSIS NO.: 200700559104
Mechanism of %%%GlvA%%% from Bacillus subtilis: A detailed kinetic analysis
  of a 6-phospho-alpha-glucosidase from glycoside hydrolase family 4
AUTHOR: Yip Vivian L Y; Thompson John; Withers Stephen G (Reprint)
AUTHOR ADDRESS: Univ British Columbia, Dept Chem, 2036 Main Mall,
  Vancouver, BC V6T 1Z1, Canada**Canada
AUTHOR E-MAIL ADDRESS: withers@chem.ubc.ca
JOURNAL: Biochemistry  46 (34): p9840-9852 AUG 28 2007 2007
ITEM IDENTIFIER: doi:10.1021/bi700536p
ISSN: 0006-2960
DOCUMENT TYPE: Article
RECORD TYPE: Abstract
LANGUAGE: English

ABSTRACT: %%%GlvA%%%, a 6-phospho-alpha-glucosidase from Bacillus subtilis
  assigned to glycoside hydrolase family 4, catalyzes the hydrolysis of
  maltose 6'-phosphate via a redox-elimination-addition mechanism requiring
  NAD(+) as cofactor. In contrast to previous reports and consistent with
  the proposed mechanism, %%%GlvA%%% is only activated in the presence of
  the nicotinamide cofactor in its oxidized, and not the reduced NADH,
  form. Significantly, %%%GlvA%%% catalyzes the hydrolysis of both
  6-phospho-alpha- and 6-phospho-beta-glucosides containing activated
  leaving groups such as p-nitrophenol and does so with retention and
  inversion, respectively, of anomeric configuration. Mechanistic details
  of the individual bond cleaving and forming steps were probed using a
  series of 6-phospho-alpha- and 6-phospho-beta-glucosides. Primary
  deuterium kinetic isotope effects (KIEs) were measured for both classes
  of substrates in which either the C2 or the C3 protons have been
  substituted with a deuterium, consistent with C-H bond cleavage at each
  center being partially rate-limiting. Kinetic parameters were also
```

determined for 1-[H-2]-substituted substrates, and depending on the substrates and the reaction conditions, the measurements of k(cat) and k(cat)/K-M produced either no KIEs or inverse KIEs. In conjunction with results of Bronsted analyses with both aryl 6-phospho-alpha- and beta-glucosides, the kinetic data suggest that %%%GlvA%%% utilizes an E1(cb) mechanism analogous to that proposed for the Thermotoga maritima BglT, a 6-phospho-beta-glucosidase in glycoside hydrolase family 4 (Yip, V.L.Y et al. (2006) Biochemistry 45, 571-580). The pattern of isotope effects measured and the observation of very similar k(cat) values for all substrates, including unactivated and natural substrates, indicate that the oxidation and deprotonation steps are rate-limiting steps in essentially all cases. This mechanism permits the cleavage of both alpha- and beta-glycosides within the same active site motif and, for activated substrates that do not require acid catalysis for cleavage, within the same active site, yielding the product sugar-6-phosphate in the same anomeric form in the two cases.

2/7/2
DIALOG(R)File 5:Biosis Previews(R)
(c) 2008 The Thomson Corporation. All rts. reserv.

0019632411 BIOSIS NO.: 200700292152
Transcriptional profiles of chicken embryo cell cultures following infection with infectious bursal disease virus
AUTHOR: Li Y P (Reprint); Handberg K J; Juul-Madsen H R; Zhang M F; Jorgensen P H
AUTHOR ADDRESS: Danish Inst Food and Vet Res, Dept Poultry Fish and Fur Anim, Hangovej 2, DK-8200 Aarhus N, Denmark**Denmark
AUTHOR E-MAIL ADDRESS: yil@dfvf.dk
JOURNAL: Archives of Virology 152 (3): p463-478 MAR 2007 2007
ISSN: 0304-8608
DOCUMENT TYPE: Article
RECORD TYPE: Abstract
LANGUAGE: English

ABSTRACT: Infectious bursal disease virus (IBDV) is the causative agent of infectious bursal disease in chickens and causes a significant economic loss for the poultry industry. Little is understood about the mechanism involved in the host responses to IBDV infection. For better understanding the IBDV-host interaction, we measured steady-state levels of transcripts from 28 cellular genes of chicken embryo (CE) cell cultures infected with IBDV vaccine stain Bursine-2 during a 7-day infection course by use of the quantitative real-time RT-PCR SYBR green method. Of the genes tested, 21 genes (IRF-1, IFN 1-2 promoter, IFNAR-1, IRF-10, IFN-gamma, 2',5'-OAS, IAP-1, caspase 8, TRAIL-like, STAT-3, IL-6, IL-8, MIP-3 alpha, MHC-I, MHC-II, TVB, %%%GLVR%%%-1, OTF, IL-13R alpha, ST3GAL-VI and PGK) showed an increased expression. The remaining seven genes (IFNAR-2, IFN-alpha, NF-kappa B subunit p65, BLRcp38, DDX1, G6PDH and UB) showed a constant expression or only slight alteration. Apparently, the host genes involved in pro-inflammatory response and apoptosis, interferon-regulated proteins, and the cellular immune response were affected by IBDV infection, indicating involvement in the complex signaling pathways of host responses to the infection. This study thus contributes to the understanding of the pathogenesis of IBD and provides an insight into the virus-host interaction.

2/7/3
DIALOG(R)File 5:Biosis Previews(R)
(c) 2008 The Thomson Corporation. All rts. reserv.

19279899 BIOSIS NO.: 200600625294
Molecular basis of cell-biomaterial interaction: Insights gained from transcriptomic and proteomic studies
AUTHOR: Gallagher William M (Reprint); Lynch Iseult; Allen Lorcan T; Miller Ian; Penney Stephen C; O'Connor Darran P; Pennington Stephen; Keenan Alan K; Dawson Kenneth A
AUTHOR ADDRESS: Univ Coll Dublin, Sch Biomol and Biomed Sci, Conway Inst Biomol and Biomed Res, Dublin 4, Ireland**Ireland
AUTHOR E-MAIL ADDRESS: william.gallagher@ucd.ie
JOURNAL: Biomaterials 27 (35): p5871-5882 DEC 2006 2006
ISSN: 0142-9612
DOCUMENT TYPE: Article
RECORD TYPE: Abstract
LANGUAGE: English

ABSTRACT: With the growing interest in clinical interventions that involve medical devices, the role for new biomaterials in modern medicine is currently expanding at a phenomenal rate. Failure of most implant materials stems from an inability to predict and control biological phenomena, such as protein adsorption and cell interaction, resulting in an inappropriate host response to the materials. Contemporary advances in biological investigation are starting to shift focus in the biomaterials field, in particular with the advent of high-throughput methodologies for gene and protein expression profiling. Here, we examine the role that emerging transcriptomic and proteomic technologies could play in relation to biomaterial development and usage. Moreover, a number of studies are highlighted which have utilized such approaches in order to try to create a deeper understanding of cell-biomaterial interactions and, hence, improve our ability to predict and control the biocompatibility of new materials. (c) 2006 Elsevier Ltd. All rights reserved.

2/7/4
DIALOG(R)File 5:Biosis Previews(R)
(c) 2008 The Thomson Corporation. All rts. reserv.

19211864 BIOSIS NO.: 200600557259
The Na+/PO4 cotransporter SLC20A1 gene labels distinct restricted subdomains of the developing pronephros in Xenopus and zebrafish embryos \
AUTHOR: Nichane Massimo; Van Campenhout Claude; Pendeville Helene; Voz Marianne L; Bellefroid Eric J (Reprint)
AUTHOR ADDRESS: Univ Libre Bruxelles, Lab Embryol Mol, IBMM, Rue Profs Jenner and Brachet 12, B-6041 Gosselies, Belgium**Belgium
AUTHOR E-MAIL ADDRESS: ebellefr@ulb.ac.be
JOURNAL: Gene Expression Patterns 6 (7): p667-672 OCT 2006 2006
ISSN: 1567-133X
DOCUMENT TYPE: Article
RECORD TYPE: Abstract
LANGUAGE: English

ABSTRACT: The embryonic pronephric kidneys of Xenopus and zebrafish serve

as models to study vertebrate nephrogenesis. Recently, multiple subdomains within the Xenopus pronephros have been defined based on the expression of several transport proteins. In contrast, very few studies on the expression of renal transporters have been conducted in zebrafish. We have recently shown that the anterior and posterior segments of the zebrafish pronephric duct may correspond to the proximal tubule and distal tubule/duct compartments of the Xenopus and higher vertebrate pronephros, respectively. Here, we report the embryonic expression pattern of the Na+/PO4 cotransporter SLC20A1 (PiT1/%%%Glvr%%%-1) gene encoding a type III sodium-dependent phosphate cotransporter in Xenopus and zebrafish. In Xenopus, SLC20A1 mRNA is expressed in the somitic mesoderm and lower level of expression is detected in the neural tube, eye, and neural crest cells. From stage 25, SLC20A1 is also detectable in the developing pronephros where expression is restricted to the late portion of the distal pronephric tubules. In zebrafish, SLC20A1 is transcribed from mid-somitogenesis in the anterior part of the pronephros where its expression corresponds to the rostral portion of the expression of other proximal tubule-specific markers. Outside the pronephros, lower level of SLC20A1 expression is also observed in the posterior cardinal and caudal veins. Based on the SLC20A1 expression domain and that of other transporters, four segments have been defined within the zebrafish pronephros. Together, our data reveal that the zebrafish and Xenopus pronephros have non-identical proximo-distal organizations. (c) 2006 Elsevier B.V. All rights reserved.

2/7/5
DIALOG(R)File 5:Biosis Previews(R)
(c) 2008 The Thomson Corporation. All rts. reserv.

19125200 BIOSIS NO.: 200600470595
Maltose and maltodextrin utilization by Bacillus subtilis
AUTHOR: Schoenert Stefan (Reprint); Seitz Sabine; Krafft Holger; Feuerbaum Eva-Anne; Andernach Iris; Witz Gabriele; Dahl Michael K
AUTHOR ADDRESS: Univ Konstanz, Fachbereich Biol, Lehrstuhl Mikrobiol, Univ Str 10,M605, D-78457 Constance, Germany**Germany
AUTHOR E-MAIL ADDRESS: stefan.schoenert@gmx.de
JOURNAL: Journal of Bacteriology 188 (11): p3911-3922 JUN 2006 2006
ISSN: 0021-9193
DOCUMENT TYPE: Article
RECORD TYPE: Abstract
LANGUAGE: English

ABSTRACT: Bacillus subtilis can utilize maltose and maltodextrins that are derived from polysaccharides, like starch or glycogen. In this work, we show that maltose is taken up by a member of the phosphoenolpyruvate-dependent phosphotransferase system and maltodextrins are taken up by a maltodextrin-specific ABC transporter. Uptake of maltose by the phosphoenolpyruvate-dependent phosphotransferase system is mediated by maltose-specific enzyme IICB (MalP; synonym, %%%GlvC%%%), with an apparent K-m of 5 mu M and a V-max of 91 nmol (.) min(-1) (.) (10(10) CFU)(-1). The maltodextrin-specific ABC transporter is composed of the maltodextrin binding protein MdxE (formerly YvdG), with affinities in the low micromolar range for maltodextrins, and the membrane-spanning components MdxF and MdxG (formerly YvdH and YvdI, respectively), as well as the energizing ATPase MsmX. Maltotriose transport occurs with an apparent K-m of 1.4 mu M and a V-max of 4.7 nmol (.) min(-1) (10(10)

CFU)(-1).

2/7/6
DIALOG(R)File 5:Biosis Previews(R)
(c) 2008 The Thomson Corporation. All rts. reserv.

18854252 BIOSIS NO.: 200600199647
Unanticipated development of cataract and nephrotic syndrome in Transgenic rats overexpressing type IIINa-dependent phosphate transporter.
AUTHOR: Suzuki A (Reprint); Nishiwaki-Yasuda K; Caverzasio J; Ono Y; Sekiguchi S; Nagao S; Takahashi H; Matsuyama M; Yan K; Kaneko R; Hirabayashi M; Ammann P; Rizzoli R; Oiso Y; Itoh M
AUTHOR ADDRESS: Fujita Hlth Univ, Div Endocrinol, Toyoake, Aichi 47011, Japan**Japan
JOURNAL: Journal of Bone and Mineral Research 20 (9, Suppl. 1): pS201 SEP 2005 2005
CONFERENCE/MEETING: 27th Annual Meeting of the American-Society-for-Bone-and-Mineral-Research Nashville, TN, USA September 23 -27, 2005; 20050923
SPONSOR: Amer Soc Bone & Mineral Res
ISSN: 0884-0431
DOCUMENT TYPE: Meeting; Meeting Abstract
RECORD TYPE: Citation
LANGUAGE: English

2/7/7
DIALOG(R)File 5:Biosis Previews(R)
(c) 2008 The Thomson Corporation. All rts. reserv.

18468558 BIOSIS NO.: 200510163058
Expression of the rat renal PiT-2 phosphate transporter
AUTHOR: Leung J C; Barac-Nieto M; Hering-Smith K; Silverstein D M (Reprint)
AUTHOR ADDRESS: Childrens Hosp, Dept Pediat, Div Nephrol, 200 Henry Clay Ave,Res and Educ Bldg,Suite 4241, New Orleans, LA 70118 USA**USA
AUTHOR E-MAIL ADDRESS: dsilve@lsumc.edu
JOURNAL: Hormone and Metabolic Research 37 (5): p265-269 MAY 2005 2005
ISSN: 0018-5043
DOCUMENT TYPE: Article
RECORD TYPE: Abstract
LANGUAGE: English

ABSTRACT: Background: NaPi-2a is the main sodium-dependent Pi (Na+-Pi) transporter in the apical membrane of the renal proximal tubule. Another group of Pi transporters, %%%Glvr%%%-1 (PiT-1) and Ram-1 (PiT-2), was identified. The PiT-2 cRNA induces Na+-dependent Pi uptake into Xenopus laevis oocytes. Prior studies have revealed the presence of the Pit-2 transporter in the kidney. Objectives: Further characterization of the PiT-2 transporter in the kidney and assessment of its developmental regulation. Methods: Using primers specific for the PiT-2 mRNA and an antibody specific for the PiT-2 protein, we assessed the expression and developmental regulation of the renal PiT-2 mRNA and protein. Results: RT-PCR analysis revealed that a 182 bp product was evident in the total kidney (TK), cortex (C), and medulla (M). Northern blots demonstrated a PiT-2 mRNA of approximately 4kb (expected size) in the TK, C, and M. PiT-2 mRNA expression was similar in all kidney regions. RT-PCR and

Northern blot analysis revealed that the PiT-2 cDNA was highly abundant in OK and MDCK culture cells. RT-PCR and Northern blot analysis revealed expected products at all ages studied. Densitometry demonstrated similar levels of expression of PiT-2 mRNA in the kidneys of older versus younger animals, and persistent expression in elderly rats. The PiT-2 protein was present in the TK, C, and M, and in OK and MDCK cells. PiT-2 protein abundance was similar at all ages studied. Conclusions: These studies further characterize the renal PiT-2 transporter and show that its expression is stable throughout development and ageing.

2/7/8
DIALOG(R)File 5:Biosis Previews(R)
(c) 2008 The Thomson Corporation. All rts. reserv.

18319641 BIOSIS NO.: 200510014141
Adsorption of serum fetuin to hydroxylapatite does not contribute to osteoblast phenotype modifications
AUTHOR: Xie Jianwei; Baumann Melissa J; McCabe Laura R (Reprint)
AUTHOR ADDRESS: Michigan State Univ, Dept Pathol and Radiol, Mol Imaging Res Ctr, 2201 Biomed Phys Sci Bldg, E Lansing, MI 48824 USA**USA
AUTHOR E-MAIL ADDRESS: mccabel@su.edu
JOURNAL: Journal of Biomedical Materials Research 73A (1): p39-47 APR 1 05 2005
ISSN: 1549-3296_(print) 1552-4965_(electronic)
DOCUMENT TYPE: Article
RECORD TYPE: Abstract
LANGUAGE: English

ABSTRACT: Osteoblasts exhibit enhanced differentiation and altered gene profiles when cultured on hydroxyapatite (HA) compared to plastic surfaces. To begin determining mechanisms for this response, we used proteomics to identify proteins predominantly found in osteoblasts on HA but not plastic surfaces. Two-dimensional gel electrophoresis and Western analyses indicate that fetuin is abundant in extracts from HA, but not plastic surfaces. Incubation of HA and plastic surfaces with cell culture medium (containing 1.0% serum) under cell-free conditions shows that fetuin is predominantly derived from the culture medium serum and readily adsorbs to the HA surface. However, we did detect low levels of fetuin B mRNA in osteoblasts. Serum albumin, actin-beta, apolipoprotein-AI, and vimentin also adsorbed to HA. To determine the role of fetuin in the HA-induced osteoblast phenotype changes, osteoblasts were seeded onto fetuin-coated or uncoated HA under serum-free conditions. Osteoblast morphology was similar on both HA surfaces, suggesting that HA alone (without adsorbed serum proteins) is sufficient for cell attachment and spreading. Similarly, genes previously reported to be modulated by HA (%%%glvr%%%-1, DMP-1, osteoglycin, and proliferin 3) were modulated even in the absence of fetuin or other serum proteins. These data show that HA surface can be enriched selectively with fetuin from serum; however, neither fetuin or other serum proteins are required to mediate HA-induced osteoblast attachment, spreading, or changes in expression of genes examined. This finding suggests that factors intrinsic to HA are required for the response. (c) 2005 Wiley Periodicals, Inc.

2/7/9
DIALOG(R)File 5:Biosis Previews(R)

(c) 2008 The Thomson Corporation. All rts. reserv.

18272179 BIOSIS NO.: 200500179244
NAD+ and metal-ion dependent hydrolysis by family 4 glycosidases: Structural insight into specificity for phospho-beta-D-glucosides
AUTHOR: Varrot Annabelle; Yip Vivian L Y; Li Yunsong; Rajan Shyamala S; Yang Xiaojing; Anderson Wayne F; Thompson John; Withers Stephen G; Davies Gideon J (Reprint)
AUTHOR ADDRESS: Dept ChemYork Struct Biol Lab, Univ York, York, N Yorkshire, YO10 5YW, UK**UK
AUTHOR E-MAIL ADDRESS: davies@ysbl.york.ac.uk
JOURNAL: Journal of Molecular Biology 346 (2): p423-435 February 18, 2005 2005
MEDIUM: print
ISSN: 0022-2836 _(ISSN print)
DOCUMENT TYPE: Article
RECORD TYPE: Abstract
LANGUAGE: English

ABSTRACT: The import of disaccharides by many bacteria is achieved through their simultaneous translocation and phosphorylation by the phosphoenolpyruvate-dependent phosphotransferase system (PEP-PTS). The imported phospho-disaccharides are, in some cases, subsequently hydrolyzed by members of the unusual glycoside hydrolase family GH4. The GH4 enzymes, occasionally found also in bacteria such as Thermotoga maritima that do not utilise a PEP-PTS system, require both NAD+ and Mn2+ for catalysis. A further curiosity of this family is that closely related enzymes may show specificity for either alpha-D- or beta-D-glycosides. Here, we present, for the first time, the three-dimensional structure (using single-wavelength anomalous dispersion methods, harnessing extensive non-crystallographic symmetry) of the 6-phospho-beta-glycosidase, BglT, from T maritima in native and complexed (NAD+ and Glc6P) forms. Comparison of the active-center structure with that of the 6-phospho-alpha-glucosidase %%%GlvA%%% from Bacillus subtilis reveals a striking degree of structural similarity that, in light of previous kinetic isotope effect data, allows the postulation of a common reaction mechanism for both alpha and beta-glycosidases. Given that the ''chemistry'' occurs primarily on the glycone sugar and features no nucleophilic attack on the intact disaccharide substrate, modulation of anomeric specificity for alpha and beta-linkages is accommodated through comparatively minor structural changes. Copyright 2004 Elsevier Ltd. All rights reserved.

2/7/10
DIALOG(R)File 5:Biosis Previews(R)
(c) 2008 The Thomson Corporation. All rts. reserv.

18083225 BIOSIS NO.: 200400464454
Osteoblasts respond to hydroxyapatite surfaces with immediate changes in gene expression
AUTHOR: Xie Jianwei; Baumann Melissa J; McCabe Laura R (Reprint)
AUTHOR ADDRESS: Dept Physiol, Michigan State Univ, 2201 Biomed Phys Sci Bldg, E Lansing, MI, 48824, USA**USA
AUTHOR E-MAIL ADDRESS: mccabel@msu.edu
JOURNAL: Journal of Biomedical Materials Research 71A (1): p108-117 October 1, 2004 2004

MEDIUM: print
ISSN: 0021-9304 _(ISSN print)
DOCUMENT TYPE: Article
RECORD TYPE: Abstract
LANGUAGE: English

ABSTRACT: Bone mineral contains hydroxyapatite (HA). This is the surface that mature osteoblasts and osteocytes interact with. Synthetic HA is widely used in orthopedic surgeries as an implant or implant coating. The bone-like HA surfaces increase implant union and bone formation; however, the mechanisms accounting for this effect on osteoblasts are not known. In this study, we compared gene expression profiles of osteoblasts responding to HA or plastic surfaces for 24 h. Expression profiles were also compared between HA discs processed with gravity-sieved compared with combined gravity and air-jet-sieved HA powders. The latter, composed of smaller HA particles, exhibits an increase in grain boundary surface area. Discs made with either HA powder similarly up-regulated osteoblast expression of 10 genes (including proliferin 3, %%%Glvr%%%-1, DMP-1, and tenascin C) and down-regulated 15 genes (such as osteoglycin) by more than 2-fold compared with plastic surfaces. The overall changes are indicative of an immediate (24-h) response to the HA surface and a trend toward osteoblast differentiation. In addition, subsets of modulated genes exist that are unique to each HA subtype. Taken together, we identified HA responsive genes evident within 24 h of surface contact, indicating a critical role for extracellular mineral surfaces in the regulation of osteoblast gene expression and phenotype. Copyright 2004 Wiley Periodicals, Inc.

2/7/11
DIALOG(R)File 5:Biosis Previews(R)
(c) 2008 The Thomson Corporation. All rts. reserv.

18059721 BIOSIS NO.: 200400430510
Stimulation of Na-dependent phosphate transport by platelet-derived growth factor in rat aortic smooth muscle cells
AUTHOR: Kakita Ayako; Suzuki Atsushi (Reprint); Nishiwaki Keiko; Ono Yasunaga; Kotake Motoko; Ariyoshi Yoh; Miura Yoshitaka; Itoh Mitsuyasu; Oiso Yutaka
AUTHOR ADDRESS: Sch MedDept Internal MedDiv Endocrinol and Metab, Fujita Hlth Univ, 1-98 Dengakugakubo,Kutsukake Cho, Toyoake, Aichi, 4701192, Japan**Japan
AUTHOR E-MAIL ADDRESS: aslapin@fujita-hu.ac.jp
JOURNAL: Atherosclerosis 174 (1): p17-24 May 2004 2004
MEDIUM: print
ISSN: 0021-9150 _(ISSN print)
DOCUMENT TYPE: Article
RECORD TYPE: Abstract
LANGUAGE: English

ABSTRACT: We investigated the effect of platelet-derived growth factor B homodimer (PDGF-BB) on inorganic phosphate (Pi) transport activity, which has been reported to be involved in the mechanism of atherosclerosis, in A-10 rat aortic vascular smooth muscle cells (VSMCs). PDGF-BB time- and dose-dependently stimulated Pi transport in A-10 cells. Using northern blot analysis, the PDGF-BB-enhanced Pi transporter (PiT) in A-10 cells was identified as Pit-1 (%%%Glvr%%%-1), a member of the type III

Na-dependent PiT. An inhibitor of PDGF P-receptor tyrosine kinase suppressed PDGF-BB-induced Pi transport. Both a protein kinase C (PKC) inhibitor calphostin C and PKC down regulation suppressed the stimulatory effect of PDGF-BB on Pi transport. On the other hand, inhibition of mitogen-activated protein (MAP) kinases by selective inhibitors did Dot affect Pi transport. Ly294002, a phosphatidylinositol (PI) 3-kinase inhibitor, partially attenuated PDGF-BB-induced Pi transport. A selective inhibitor Of S6 kinase, rapamycin, reduced this effect of PDGF-BB, while Akt kinase inhibitor did not. In summary, these results indicated that PDGF-BB is a potent and selective stimulator of Pi transport in VSMCs. The mechanism responsible for this effect is not mediated by MAP kinase, but involves activation of PKC, PI 3-kinase and S6 kinase. Copyright 2004 Published by Elsevier Ireland Ltd.

2/7/12
DIALOG(R)File 5:Biosis Previews(R)
(c) 2008 The Thomson Corporation. All rts. reserv.

17791357 BIOSIS NO.: 200400158698
The SLC20 family of proteins: Dual functions as sodium-phosphate cotransporters and viral receptors.
AUTHOR: Collins James F; Bai Liqun; Ghishan Fayez K (Reprint)
AUTHOR ADDRESS: Department of Pediatrics, Steele Memorial Children's Research Center, University of Arizona College of Medicine, 1501 N. Campbell Ave., P.O. Box 245073, Tucson, AZ, 85724, USA**USA
AUTHOR E-MAIL ADDRESS: fghishan@peds.arizona.edu
JOURNAL: Pfluegers Archiv European Journal of Physiology 447 (5): p647-652 February 2004 2004
MEDIUM: print
ISSN: 0031-6768 _(ISSN print)
DOCUMENT TYPE: Article; Literature Review
RECORD TYPE: Abstract
LANGUAGE: English

ABSTRACT: The SLC20 family transport proteins were originally identified as retroviral receptors (called %%%Glvr%%%-1 and Ram-1). Since then, they have been shown to function as sodium-phosphate (Na/Pi) cotransporters, and have subsequently been classified as type III Na/Pi cotransporters (now called Pit-1 and Pit-2). The Pit cotransporters share apprxeq660% sequence homology, they have a high affinity for Pi, they are electrogenic with a coupling stoichiometry of >1 Na+ per Pi ion cotransported, and are inhibited by alkaline pH and phosphonoformic acid (PFA). Pit-1 and Pit-2 expression and/or activity has also been shown to be regulated by Pi deprivation in some, but not all cells and tissues examined. The Pit-1 and Pit-2 cotransporters are widely expressed, but cell-type specific expression has only been investigated in bone, kidney and intestine. Both proteins are likely expressed on the basolateral membranes of polarized epithelial cells, where they are likely involved in cellular Pi homeostasis. The Pit-1 and Pit-2 gene promoters have been cloned and characterized. While the exact roles of the Pit cotransporters in different cell types has not been definitively determined, they may be involved in important physiological pathways in bone, aortic smooth muscle cells, parathyroid glands, kidney and intestine.

2/7/13

DIALOG(R)File 5:Biosis Previews(R)
(c) 2008 The Thomson Corporation. All rts. reserv.

17480408 BIOSIS NO.: 200300437442
Vascular calcification: In vitro evidence for the role of inorganic phosphate.
AUTHOR: Giachelli Cecilia M (Reprint)
AUTHOR ADDRESS: Bioengineering Department, University of Washington, Box 351720, Seattle, WA, 98195-1720, USA**USA
AUTHOR E-MAIL ADDRESS: ceci@u.washington.edu
JOURNAL: Journal of the American Society of Nephrology 14 (Supplement 4): pS300-S304 September 2003 2003
MEDIUM: print
ISSN: 1046-6673
DOCUMENT TYPE: Article
RECORD TYPE: Abstract
LANGUAGE: English

ABSTRACT: Uremic patients are prone to widespread ectopic extraskeletal calcification resulting from an imbalance of systemic inorganic phosphate (Pi). There can be serious consequences of this process, particularly when it results in the calcification of the vasculature. A recent study examined the response of cultured human aortic smooth muscle cells to varying levels of extracellular Pi. Cells that were exposed to Pi levels similar to those seen in uremic patients (>1.4 mmol/L) showed dose-dependent increases in cell culture calcium deposition. The results of this study also defined the role of elevated phosphate in transforming the vascular phenotype of these cells to an osteogenic phenotype, such that a predisposition for calcification was created. Pi-induced changes included increased expression of the osteogenic markers osteocalcin and core-binding factor-1 genes, the latter of which is considered a "master gene" critical for osteoblast differentiation. These changes occur early after exposure to high phosphate levels and seem to be mediated by a sodium-dependent phosphate co-transporter, Pit-1 (%%%Glvr%%%-1). Calcification of vascular cells also seems to occur in the absence of a mineral imbalance but in the presence of platelet-derived growth factor, a potent atherogenic factor. Taken together, these data suggest that calcification of vascular cells can occur early in a phosphate-rich environment similar to that seen in patients with renal failure and in a platelet-derived growth factor-rich atherosclerotic region under normal phosphorus conditions. From a clinical viewpoint, it seems that early control or prevention of hyperphosphatemia may reduce coronary calcification and its associated morbidity and mortality for patients on dialysis.

2/7/14
DIALOG(R)File 5:Biosis Previews(R)
(c) 2008 The Thomson Corporation. All rts. reserv.

17480096 BIOSIS NO.: 200300437130
Vascular calcification: In vitro evidence for the role of inorganic phosphate.
AUTHOR: Giachelli Cecilia M (Reprint)
AUTHOR ADDRESS: Bioengineering Department, University of Washington, Box 351720, Seattle, WA, 98195-1720, USA**USA
AUTHOR E-MAIL ADDRESS: ceci@u.washington.edu

JOURNAL: Journal of the American Society of Nephrology 14 (9 Supplement 4): pS300-S304 September 2003 2003
MEDIUM: print
ISSN: 1046-6673
DOCUMENT TYPE: Article
RECORD TYPE: Abstract
LANGUAGE: English

ABSTRACT: Uremic patients are prone to widespread ectopic extraskeletal calcification resulting from an imbalance of systemic inorganic phosphate (Pi). There can be serious consequences of this process, particularly when it results in the calcification of the vasculature. A recent study examined the response of cultured human aortic smooth muscle cells to varying levels of extracellular Pi. Cells that were exposed to Pi levels similar to those seen in uremic patients (>1.4 mmol/L) showed dose-dependent increases in cell culture calcium deposition. The results of this study also defined the role of elevated phosphate in transforming the vascular phenotype of these cells to an osteogenic phenotype, such that a predisposition for calcification was created. Pi-induced changes included increased expression of the osteogenic markers osteocalcin and core-binding factor-1 genes, the latter of which is considered a "master gene" critical for osteoblast differentiation. These changes occur early after exposure to high phosphate levels and seem to be mediated by a sodium-dependent phosphate co-transporter, Pit-1 (%%%Glvr%%%-1). Calcification of vascular cells also seems to occur in the absence of a mineral imbalance but in the presence of platelet-derived growth factor, a potent atherogenic factor. Taken together, these data suggest that calcification of vascular cells can occur early in a phosphate-rich environment similar to that seen in patients with renal failure and in a platelet-derived growth factor-rich atherosclerotic region under normal phosphorus conditions. From a clinical viewpoint, it seems that early control or prevention of hyperphosphatemia may reduce coronary calcification and its associated morbidity and mortality for patients on dialysis.

2/7/15
DIALOG(R)File 5:Biosis Previews(R)
(c) 2008 The Thomson Corporation. All rts. reserv.

16877300 BIOSIS NO.: 200200470811
Transport of inorganic phosphate in primary cultures of chondrocytes isolated from the tibial growth plate of normal adolescent chickens
AUTHOR: Wu Licia N Y; Guo Yande; Genge Brian R; Ishikawa Yoshinori; Wuthier Roy E (Reprint)
AUTHOR ADDRESS: Department of Chemistry and Biochemistry, University of South Carolina, 329 Graduate Science Research Center, Columbia, SC, 29208, USA**USA
JOURNAL: Journal of Cellular Biochemistry 86 (3): p475-489 2002 2002
MEDIUM: print
ISSN: 0730-2312
DOCUMENT TYPE: Article
RECORD TYPE: Abstract
LANGUAGE: English

ABSTRACT: This report describes Pi transport activity in chondrocytes isolated from the growth plate (GP) of normal adolescent chickens grown

in primary cell culture. Our recent work showed that Pi transport in matrix vesicles (MV) isolated from normal GP cartilage was not strictly Na+-dependent, whereas previously characterized Pi transport from rachitic GP cartilage MV was. This Na+-dependent Pi transporter (NaPiT), a member of the Type III %%%Glvr%%%-1 gene family, is expressed only transiently during early differentiation of GP cartilage, is enhanced by Pi-deficiency, and is most active at pH 6.8. Since GP mineralization requires abundant Pi and occurs under slightly alkaline conditions, it seemed unlikely that this type of Pi transporter was solely responsible for Pi uptake during normal GP development. Therefore we asked whether the lack of strict Na+-dependency in Pi transport seen in normal MV was also evident in normal GP chondrocytes. In fact, cellular Pi transport was found not to be strictly Na+-dependent, except for a brief period early in the culture. Choline could equally serve as a Na+ substitute. Activity of choline-supported Pi transport was optimum at pH 7.6-8.0. In addition, prior exposure of the cells to elevated extracellular Pi (2-3 mM) strongly enhanced subsequent Pi uptake, which appeared to depend on prior loading of the cells with mineral ions. Prevention of Pi loading by pretreatment with Pi transport inhibitors not only inhibited subsequent cellular Pi uptake, it also blocked mineral formation. Treatment with elevated extracellular Pi did not induce apoptosis in these GP chondrocytes.

2/7/16
DIALOG(R)File 5:Biosis Previews(R)
(c) 2008 The Thomson Corporation. All rts. reserv.

16673401 BIOSIS NO.: 200200266912
Regulation of Sp factor by cAMP in skeletalgenesis
AUTHOR: Fujita Takashi (Reprint); Meguro Toru (Reprint); Nakamuta Hiromichi (Reprint); Koida Masao (Reprint)
AUTHOR ADDRESS: Dept. Pharmacol., Fac. Pharmac. Sci., Setsunan Univ., Hirakata, Osaka, 573-0101, Japan**Japan
JOURNAL: Japanese Journal of Pharmacology 88 (Supplement 1): p107P 2002 2002
MEDIUM: print
CONFERENCE/MEETING: 75th Annual Meeting of the Japanese Pharmacological Society Kumamoto, Japan March 13-15, 2002; 20020313
SPONSOR: Japanese Pharmacological Society
ISSN: 0021-5198
DOCUMENT TYPE: Meeting; Meeting Abstract
RECORD TYPE: Citation
LANGUAGE: English

2/7/17
DIALOG(R)File 5:Biosis Previews(R)
(c) 2008 The Thomson Corporation. All rts. reserv.

16395854 BIOSIS NO.: 200100567693
Cloning and expression of two garlic virus coat protein genes
AUTHOR: Ma Yun; Yang Gong; Xu Shaohua; Wei Junya; Qiu Bingsheng (Reprint)
AUTHOR ADDRESS: Institute of Microbiology, Chinese Academy of Sciences, Beijing, 100080, China**China
JOURNAL: Weishengwu Xuebao 41 (4): p415-420 August, 2001 2001
MEDIUM: print

ISSN: 0001-6209
DOCUMENT TYPE: Article
RECORD TYPE: Abstract
LANGUAGE: Chinese

ABSTRACT: The coat protein (CP) genes of garlic mosaic virus (GMVc) and garlic latent virus (%%%GLVc%%%) isolated from garlic (Allium) plants in Tianjin, China, were amplified from an established cDNA library by PCR method and subsequently expressed in E. coli using the pET-30a expression system. The determined sequences of GMVc and %%%GLVc%%% CP genes show that the complete GMVc CP gene has 867 nucleotides encoding 289 amino acids. It has 88.5% and 97.2% homology, at the levels of nucleotide and amino acid, respectively, to a reported GMV, indicating that it belongs to Potyvirus. The complete %%%GLVc%%% CP gene has 885 nucleotides coding for 294 amino acids. It has 73.6% and 90.9% homologous percents, in nucleotide and amino acid, respectively, compared to a previously reported GLV, suggesting that it is a member of Carlavirus. The expressed products presented in inclusion body and were analyzed by SDS-PAGE. The molecular weights of GMVc and %%%GLVc%%% CPs appear in 32kD and 34 kD size, respectively, which are consistent with the deduced sizes of these two CPs. These data will be virtually significant to the further investigation of viruses infecting parlic plant, the control of garlic virus diseases and the production of virus-freed garlic plants.

2/7/18
DIALOG(R)File 5:Biosis Previews(R)
(c) 2008 The Thomson Corporation. All rts. reserv.

16302014 BIOSIS NO.: 200100473853
Alterations in the sensing and transport of phosphate and calcium by differentiating chondrocytes
AUTHOR: Wang Dashen; Canaff Lucie; Davidson David; Corluka Adrijana; Liu Hanlong; Hendy Geoffrey N; Henderson Janet E (Reprint)
AUTHOR ADDRESS: Lady Davis Inst., 3755 Cote Ste. Catherine Rd., Rm. 602, Montreal, PQ, H3T 1E2, Canada**Canada
JOURNAL: Journal of Biological Chemistry 276 (36): p33995-34005 September 7, 2001 2001
MEDIUM: print
ISSN: 0021-9258
DOCUMENT TYPE: Article
RECORD TYPE: Abstract
LANGUAGE: English

ABSTRACT: During endochondral bone formation and fracture healing, cells committed to chondrogenesis undergo a temporally restricted program of differentiation that is characterized by sequential changes in their phenotype and gene expression. This results in the manufacture, remodeling, and mineralization of a cartilage template on which bone is laid down. Articular chondrocytes undergo a similar but restricted differentiation program that does not proceed to mineralization, except in pathologic conditions such as osteoarthritis. The pathogenesis of disorders of cartilage development and metabolism, including osteochondrodysplasia, fracture non-union, and osteoarthritis remain poorly defined. We used the CFK2 model to examine the potential roles of phosphate and calcium ions in the regulatory pathways that mediate chondrogenesis and cartilage maturation. Differentiation was monitored

over a 4-week period using a combination of morphological, biochemical, and molecular markers that have been characterized in vivo and in vitro. CFK2 cells expressed the type III sodium-dependent phosphate transporters %%%Glvr%%%-1 and Ram-1, as well as a calcium-sensing mechanism. Regulated expression and activity of %%%Glvr%%%-1 by extracellular phosphate and parathyroid hormone-related protein was restricted to an early stage of CFK2 differentiation, as evidenced by expression of type II collagen, proteoglycan, and Ihh. On the other hand, regulated expression and activity of a calcium-sensing receptor by extracellular calcium was most evident after 2 weeks of differentiation, concomitant with an increase in type X collagen expression, alkaline phosphatase activity and parathyroid hormone/parathyroid hormone-related protein receptor expression. On the basis of these temporally restricted changes in the sensing and transport of phosphate and calcium, we predict that extracellular phosphate plays a role in the commitment of chondrogenic cells to differentiation, whereas extracellular calcium plays a role at a later stage in their differentiation program.

2/7/19
DIALOG(R)File 5:Biosis Previews(R)
(c) 2008 The Thomson Corporation. All rts. reserv.

16249024 BIOSIS NO.: 200100420863
Regulation of the glv operon in Bacillus subtilis: YfiA (%%%GlvR%%%) is a positive regulator of the operon that is repressed through CcpA and cre
AUTHOR: Yamamoto Hiroki; Serizawa Masakuni; Thompson John; Sekiguchi Junichi (Reprint)
AUTHOR ADDRESS: Department of Applied Biology, Faculty of Textile Science and Technology, Shinshu University, 3-15-1 Tokida, Ueda-shi, Nagano, 386-8567, Japan**Japan
JOURNAL: Journal of Bacteriology 183 (17): p5110-5121 September, 2001 2001
MEDIUM: print
ISSN: 0021-9193
DOCUMENT TYPE: Article
RECORD TYPE: Abstract
LANGUAGE: English

ABSTRACT: Maltose metabolism and the regulation of the glv operon of Bacillus subtilis, comprising three genes, %%%glvA%%% (6-phospho-alpha-glucosidase), yfiA (now designated %%%glvR%%%), and %%%glvC%%% (EIICB transport protein), were investigated. Maltose dissimilation was dependent primarily upon the glv operon, and insertional inactivation of either %%%glvA%%%, %%%glvR%%%, or %%%glvC%%% markedly inhibited growth on the disaccharide. A second system (MaIL) contributed to a minor extent to maltose metabolism. Northern blotting revealed two transcripts corresponding to a monocistronic mRNA of %%%glvA%%% and a polycistronic mRNA of %%%glvA%%%-%%%glvR%%%-%%%glvC%%%. Primer extension analysis showed that both transcripts started at the same base (G) located 26 bp upstream of the 5' end of %%%glvA%%%. When %%%glvR%%% was placed under control of the spac promoter, expression of the glv operon was dependent upon the presence of isopropyl-beta-D-thiogalactopyranoside (IPTG). In regulatory studies, the promoter sequence of the glv operon was fused to lacZ and inserted into the amyE locus, and the resultant strain (AMGLV) was then transformed with a citrate-controlled %%%glvR%%% plasmid, pHYCM2VR. When cultured in Difco sporulation medium containing citrate, this transformant

(AMGLV(pHYCM2VR)) expressed LacZ activity, but synthesis of LacZ was repressed by glucose. In an isogenic strain, (AMGLVCR(pHYCM2VR)), except for a mutation in the sequence of a catabolite-responsive element (cre), LacZ activity was expressed in the presence of citrate and glucose. Insertion of a citrate-controlled %%%glvR%%% plasmid at the amyE locus of ccpA+ and ccpA mutant organisms yielded strains AMCMVR and AMCMVRCC, respectively. In the presence of both glucose and citrate, AMCMVR failed to express the glv operon, whereas under the same conditions high-level expression of both mRNA transcripts was found in strain AMCMVRCC. Collectively, our findings suggest that %%%GlvR%%% (the product of the %%%glvR%%% gene) is a positive regulator of the glv operon and that glucose exerts its effect via catabolite repression requiring both CcpA and cre.

2/7/20
DIALOG(R)File 5:Biosis Previews(R)
(c) 2008 The Thomson Corporation. All rts. reserv.

16212393 BIOSIS NO.: 200100384232
Glycosphingolipids modulate renal phosphate transport in potassium deficiency
AUTHOR: Zajicek Hubert K; Wang Huamin; Puttaparthi Krishna; Halaihel Nabil; Markovich Daniel; Shayman James; Beliveau Richard; Wilson Paul; Rogers Thomas; Levi Moshe (Reprint)
AUTHOR ADDRESS: V.A. Medical Center, 4500 South Lancaster Road, Dallas, TX, 75216, USA**USA
JOURNAL: Kidney International 60 (2): p694-704 August, 2001 2001
MEDIUM: print
ISSN: 0085-2538
DOCUMENT TYPE: Article
RECORD TYPE: Abstract
LANGUAGE: English

ABSTRACT: Background: Potassium (K) deficiency (KD) and/or hypokalemia have been associated with disturbances of phosphate metabolism. The purpose of the present study was to determine the cellular mechanisms that mediate the impairment of renal proximal tubular Na/Pi cotransport in a model of K deficiency in the rat. Methods: K deficiency in the rat was achieved by feeding rats a K-deficient diet for seven days, which resulted in a marked decrease in serum and tissue K content. Results: K deficiency resulted in a marked increase in urinary Pi excretion and a decrease in the Vmax of brush-border membrane (BBM) Na/Pi cotransport activity (1943+-95 in control vs. 1184+-99 pmol/5 sec/mg BBM protein in K deficiency, P<0.02). Surprisingly, the decrease in Na/Pi cotransport activity was associated with increases in the abundance of type I (NaPi-1), and type II (NaPi-2) and type III (%%%Glvr%%%-1) Na/Pi protein. The decrease in Na/Pi transport was associated with significant alterations in BBM lipid composition, including increases in sphingomyelin, glucosylceramide, and ganglioside GM3 content and a decrease in BBM lipid fluidity. Inhibition of glucosylceramide synthesis resulted in increases in BBM Na/Pi cotransport activity in control and K-deficient rats. The resultant Na/Pi cotransport activity in K-deficient rats was the same as in control rats (1148+-52 in control+PDMP vs. 1152+-61 pmol/5 sec/mg BBM protein in K deficiency+PDMP). These changes in transport activity occurred independent of further changes in BBM NaPi-2 protein or renal cortical NaPi-2 mRNA abundance. Conclusion: K

deficiency in the rat causes inhibition of renal Na/Pi cotransport activity by post-translational mechanisms that are mediated in part through alterations in glucosylceramide content and membrane lipid dynamics.

2/7/21
DIALOG(R)File 5:Biosis Previews(R)
(c) 2008 The Thomson Corporation. All rts. reserv.

16177830 BIOSIS NO.: 200100349669
Phosphate ions mediate chondrocyte apoptosis through a plasma membrane transporter mechanism
AUTHOR: Mansfield K; Teixeira C C; Adams C S; Shapiro I M (Reprint)
AUTHOR ADDRESS: Department of Biochemistry, School of Dental Medicine, University of Pennsylvania, 4001 Spruce Street, Philadelphia, PA, 19104-6003, USA**USA
JOURNAL: Bone (New York) 28 (1): p1-8 January, 2001 2001
MEDIUM: print
ISSN: 8756-3282
DOCUMENT TYPE: Article
RECORD TYPE: Abstract
LANGUAGE: English

ABSTRACT: In a previous investigation we showed that phosphate ions (Pi) induced apoptosis of terminally differentiated hypertrophic chondrocytes. To explore the mechanism by which Pi induces cell death, we asked the following two questions. First, can we prevent Pi-induced apoptosis by inhibiting plasma membrane Na-Pi cotransport? Second, which specific Na-Pi transporters are expressed in chondrocytes and are they developmentally regulated? Terminally differentiated hypertrophic chondrocytes were isolated from chick tibial cartilage and cell death was measured in the presence of 3-7 mmol/L Pi. To ascertain whether apoptosis was linked to a rise in cellular Pi loading, we examined the effect of phosphonoformic acid (PFA), a competitive inhibitor of Na-Pi cotransport on Pi-induced apoptosis in chondrocytes. We found that 1 mmol/L PFA blocked anion-induced cell death and prevented an increase in the cell Pi content. In a parallel study, we determined that the bisphosphonate, alendronate, also protected chondrocytes from death, albeit at a lower concentration than PFA. Using a DNA end-labeling procedure, we showed that the Pi-treated cells were apoptotic and, as might be predicted, the presence of PFA blocked induction of the death sequence. Next, we examined the expression of two Pi transporters in relation to chondrocyte maturation and anion treatment. We noted that there was expression of the constitutive transporter, %%%Glvr%%%-1, and a type II cotransporter in chick growth plate cells. Although these transport systems are active in terminally differentiated cells, it is probable that the initiation of apoptosis may require the induction of other Pi-transport systems. It is concluded that, at the mineralization front, cell death is linked directly to the elevation in environmental anion concentration and the concomitant rise in intracellular Pi levels.

2/7/22
DIALOG(R)File 5:Biosis Previews(R)
(c) 2008 The Thomson Corporation. All rts. reserv.

15980707 BIOSIS NO.: 200100152546
Transforming growth factor-beta stimulates inorganic phosphate transport and expression of the type III phosphate transporter %%%Glvr%%%-1 in chondrogenic ATDC5 cells
AUTHOR: Palmer Gaby; Guicheux Jerome; Bonjour Jean-Philippe; Caverzasio Joseph (Reprint)
AUTHOR ADDRESS: Division of Bone Diseases, Department of Internal Medicine, University Hospital of Geneva, CH-1211, Geneva 14, Switzerland** Switzerland
JOURNAL: Endocrinology 141 (6): p2236-2243 June, 2000 2000
MEDIUM: print
ISSN: 0013-7227
DOCUMENT TYPE: Article
RECORD TYPE: Abstract
LANGUAGE: English

ABSTRACT: Members of the transforming growth factor (TGF)-beta family are important regulators of skeletal development. In this study, we investigated the effect of TGF-beta1 on inorganic phosphate (Pi) transport and on expression of the type III Pi carriers %%%Glvr%%%-1 and Ram-1 in murine ATDC5 chondrocytes. TGF-beta1 induced a selective, dose- and time-dependent increase in sodium-dependent Pi transport in ATDC5 cells. This response was dependent on RNA and protein synthesis and reflected a change in the maximal rate of the transport system, suggesting that TGF-beta1 induces the synthesis of new Pi carriers and their insertion into the plasma membrane. Consistently, Northern blotting analysis showed a dose-dependent increase in %%%Glvr%%%-1 messenger RNA expression in response to TGF-beta1, which preceded the maximal stimulation of Pi transport by several hours. %%%Glvr%%%-1 thus likely mediates at least part of the increase in Pi uptake induced by TGF-beta1. Ram-1 messenger RNA expression was not affected by TGF-beta1. TGF-beta1 activated the Smad signaling pathway and the mitogen-activated protein kinases ERK and p38 in ATDC5 cells. Unlike the regulation of Pi transport by receptor tyrosine kinase agonists in osteoblasts, the effect of TGF-beta1 on Pi uptake in ATDC5 cells did not involve protein kinase C or mitogen-activated protein kinases, suggesting that a specific, possibly Smad-dependent, signal mediates this response. In conclusion, TGF-beta1 stimulates Pi transport and %%%Glvr%%%-1 expression in chondrocytes, suggesting that, like proliferation, differentiation, and matrix synthesis, Pi handling is subject to regulation by TGF-beta family members in bone-forming cells.

2/7/23
DIALOG(R)File 5:Biosis Previews(R)
(c) 2008 The Thomson Corporation. All rts. reserv.

15675257 BIOSIS NO.: 200000393570
A novel in vitro culture system for analysis of functional role of phosphate transport in endochondral ossification
AUTHOR: Guicheux J; Palmer G; Shukunami C; Hiraki Y; Bonjour J P; Caverzasio J (Reprint)
AUTHOR ADDRESS: Division of Bone Diseases, Department of Internal Medicine, University Hospital of Geneva, CH-1211, Geneva 14, Switzerland** Switzerland
JOURNAL: Bone (New York) 27 (1): p69-74 July, 2000 2000
MEDIUM: print

ISSN: 8756-3282
DOCUMENT TYPE: Article
RECORD TYPE: Abstract
LANGUAGE: English

ABSTRACT: In vivo expression of the type III sodium-dependent phosphate transporter (NaPiT) %%%Glvr%%%-1 during endochondral ossification, suggests a functional role for inorganic phosphate (Pi) transport in cartilage calcification. For further analysis of this relationship, an in vitro model of endochondral ossification is required. In this context, we investigated the characteristics of Pi transport in the new chondrogenic cell line ATDC5 in relation to extracellular matrix (ECM) formation and mineralization. Pi uptake in ATDC-5 cells and in isolated matrix vesicles (MVs) is mediated by an Na-dependent Pi transporter with a pH dependency characteristic of a type III Pi carrier (lower activity at alkaline pH). Northern blot analysis indicated that ATDC-5 cells express %%%Glvr%%%-1 transcripts during the various stages of their maturation with a maximal level during the proliferating stage. In isolated MVs, Pi transport activity was maximal at day 21, concomitant with the beginning of type X collagen messenger RNA expression. These events preceded the initiation of matrix mineralization, which was apparent at day 25, and then gradually increased until day 47. This temporal relationship between maximal Pi transport activity in MVs and the expression of a marker of mineralizing chondrocytes is compatible with the possible involvement of Pi transport in the ECM calcification observed in ATDC-5 cell cultures. In conclusion, these observations suggest that ATCD-5 cells in culture represent a promising model for the analysis of a functional role of Pi transport in the initial events of endochondral ossification.

2/7/24
DIALOG(R)File 5:Biosis Previews(R)
(c) 2008 The Thomson Corporation. All rts. reserv.

15669514 BIOSIS NO.: 200000387827
Lentiviral vectors pseudotyped with envelope glycoproteins derived from gibbon ape leukemia virus and murine leukemia virus 10A1
AUTHOR: Stitz J; Buchholz C J; Engelstaedter M; Uckert W; Bloemer U; Schmitt I; Cichutek K (Reprint)
AUTHOR ADDRESS: Department of Medical Biotechnology, Paul-Ehrlich-Institut, Paul-Ehrlich-Strasse 51-59, 63225, Langen, Germany**Germany
JOURNAL: Virology 273 (1): p16-20 July 20, 2000 2000
MEDIUM: print
ISSN: 0042-6822
DOCUMENT TYPE: Article
RECORD TYPE: Abstract
LANGUAGE: English

ABSTRACT: Lentiviral vectors pseudotyped with the envelope glycoproteins (Env) of amphotropic murine leukemia virus (MLV) and the G protein of vesicular stomatitis virus (VSV-G) have been successfully used in recent preclinical gene therapy studies. We report here the generation of infectious HIV-1-derived vector particles pseudotyped with the Env of the molecular clone 10A1 of MLV and with chimeric envelope glycoprotein variants derived from gibbon ape leukemia virus (GaLV) and MLV. Formation of infectious HIV-1 (GaLV) pseudotype vectors was only possible with the substitution of the cytoplasmic tail of GaLV Env with that of MLV. The

lentiviral vectors exhibited a host cell range identical with that of MLV(GaLV) and MLV(10A1) vectors, which are known to enter cells either via the GaLV-receptor %%%Glvr%%%-1 (Pit-1) or via the amphotropic receptor Ram-1 (Pit-2) in addition to %%%Glvr%%%-1, respectively. Thus, HIV-1(GaLV) and HIV-1(10A1) pseudotype vectors may be useful for efficient gene transfer into a variety of human tissues like primary human hematopoietic cells.

2/7/25
DIALOG(R)File 5:Biosis Previews(R)
(c) 2008 The Thomson Corporation. All rts. reserv.

15629847 BIOSIS NO.: 200000348160
Effects of Npt2 gene ablation and low-phosphate diet on renal Na+/phosphate cotransport and cotransporter gene expression
AUTHOR: Hoag Hannah M; Martel Josee; Gauthier Claude; Tenenhouse Harriet S (Reprint)
AUTHOR ADDRESS: Montreal Children's Hospital, 2300 Tupper Street, Montreal, Quebec, H3H 1P3, Canada**Canada
JOURNAL: Journal of Clinical Investigation 104 (6): p679-686 September, 1999 1999
MEDIUM: print
ISSN: 0021-9738
DOCUMENT TYPE: Article
RECORD TYPE: Abstract
LANGUAGE: English

ABSTRACT: The renal Na+/phosphate (Pi) cotransporter Npt2 is expressed in the brush border membrane (BBM) of proximal tubular cells. We examined the effect of Npt2 gene knockout on age-dependent BBM Na+/Pi cotransport, expression of Na+/Pi cotransporter genes Npt1, %%%Glvr%%%-1, and Ram-1, and the adaptive response to chronic Pi deprivation. Na+/Pi cotransport declines with age in wild-type mice (Npt2+/+), but not in mice homozygous for the disrupted Npt2 allele (Npt2-/-). At all ages, Na+/Pi cotransport in Npt2-/- mice is approximately 15% of that in Npt2+/+ littermates. Only Npt1 mRNA abundance increases with age in Npt2+/+ mice, whereas Npt1, %%%Glvr%%%-1, and Ram-1 mRNAs show an age-dependent increase in Npt2-/- mice. Pi deprivation significantly increases Na+/Pi cotransport, Npt2 protein, and mRNA in Npt2+/+ mice. In contrast, Pi-deprived Npt2-/- mice fail to show the adaptive increase in transport despite exhibiting a fall in serum Pi. We conclude that (a) Npt2 is a major determinant of BBM Na+/Pi cotransport; (b) the age-dependent increase in Npt1, %%%Glvr%%%-1, and Ram-1 mRNAs in Npt2-/- mice is insufficient to compensate for loss of Npt2; and (c) Npt2 is essential for the adaptive BBM Na+/Pi cotransport response to Pi deprivation.

2/7/26
DIALOG(R)File 5:Biosis Previews(R)
(c) 2008 The Thomson Corporation. All rts. reserv.

15515065 BIOSIS NO.: 200000233378
Structure of the murine Pit1 phosphate transporter/retrovirus receptor gene and functional characterization of its promoter region
AUTHOR: Palmer Gaby; Manen Danielle; Bonjour Jean-Philippe; Caverzasio Joseph (Reprint)

AUTHOR ADDRESS: Division of Bone Diseases, Department of Internal Medicine, WHO Collaborating Center for Osteoporosis and Bone Diseases, University Hospital, Geneva, Switzerland**Switzerland
JOURNAL: Gene (Amsterdam) 244 (1-2): p35-45 Feb. 22, 2000 2000
MEDIUM: print
ISSN: 0378-1119
DOCUMENT TYPE: Article
RECORD TYPE: Abstract
LANGUAGE: English

ABSTRACT: The Pit1 phosphate transporter (formerly also called %%%Glvr%%%-1) probably plays an important role in regulated phosphate handling in bone-forming cells. In this study, we describe the structure of the mouse Pit1 gene, as well as some functional characteristics of its promoter region in murine bone cells. Screening of a genomic library led to the isolation of two overlapping lambda clones containing 7 kb of 5' flanking region, as well as the 10 exons of the mouse Pit1 gene corresponding to the published cDNA. The translation start site is located within exon I and the stop codon within exon X. The overall structure of the mouse gene is very similar to that of its human homolog, except for the presence of an additional 5' untranslated exon in human. The structure of the 5' untranslated region of the mouse gene was thus further investigated using rapid amplification of cDNA ends in murine ATDC5, MC3T3-E1 and Swiss 3T3 cells. The results indicate that, compared to the published cDNA, the mouse Pit1 gene contains in fact one additional 5' exon, which we named exon IA. Reporter gene assays demonstrate the presence of a functional TATA box containing promoter upstream of exon IA. This description of the murine Pit1 gene and of its promoter region paves the way to more detailed analyses concerning the regulation of Pit1 transcription in mouse cells. Furthermore, a comparison of mouse and human promoters will hopefully allow a better understanding of general mechanisms regulating Pit1 expression in different species.

2/7/27
DIALOG(R)File 5:Biosis Previews(R)
(c) 2008 The Thomson Corporation. All rts. reserv.

15183591 BIOSIS NO.: 199900443251
Transforming growth factor-beta stimulates inorganic phosphate (Pi) transport and expression of the type III Pi transporter %%%Glvr%%%-1 in chondrogenic ATDC5 cells
AUTHOR: Palmer G (Reprint); Guicheux J (Reprint); Bonjour J P (Reprint); Caverzasio J (Reprint)
AUTHOR ADDRESS: Division of Bone Diseases, Dept. of Int. Medicine, University Hospital, Geneva, Switzerland**Switzerland
JOURNAL: Journal of Bone and Mineral Research 14 (SUPPL. 1): pS426 Sept., 1999 1999
MEDIUM: print
CONFERENCE/MEETING: Twenty-First Annual Meeting of the American Society for Bone and Mineral Research St. Louis, Missouri, USA September 30-October 4, 1999; 19990930
SPONSOR: American Society for Bone and Mineral Research
ISSN: 0884-0431
DOCUMENT TYPE: Meeting; Meeting Abstract
RECORD TYPE: Citation
LANGUAGE: English

2/7/28
DIALOG(R)File 5:Biosis Previews(R)
(c) 2008 The Thomson Corporation. All rts. reserv.

15178797 BIOSIS NO.: 199900438457
Differentiation stage-specific regulation of a sodium-dependent phosphate transporter (%%%Glvr%%%-1) by calcium and phosphate in chondrocytes in vitro
AUTHOR: Wang D (Reprint); Aarts M (Reprint); Canaff L (Reprint); Hendy G N (Reprint); Henderson J E (Reprint)
AUTHOR ADDRESS: Medicine, McGill University, Montreal, PQ, Canada**Canada
JOURNAL: Journal of Bone and Mineral Research 14 (SUPPL. 1): pS435 Sept., 1999 1999
MEDIUM: print
CONFERENCE/MEETING: Twenty-First Annual Meeting of the American Society for Bone and Mineral Research St. Louis, Missouri, USA September 30-October 4, 1999; 19990930
SPONSOR: American Society for Bone and Mineral Research
ISSN: 0884-0431
DOCUMENT TYPE: Meeting; Meeting Abstract
RECORD TYPE: Citation
LANGUAGE: English

2/7/29
DIALOG(R)File 5:Biosis Previews(R)
(c) 2008 The Thomson Corporation. All rts. reserv.

15134596 BIOSIS NO.: 199900394256
Up-regulation of amphotrophic retroviral receptor expression in human peripheral blood CD34+ cells
AUTHOR: Kaubisch Andreas; Ward Maureen; Schoetz Stuti; Hesdorffer Charles; Bank Arthur (Reprint)
AUTHOR ADDRESS: HHSC 16-1604, Columbia University, 701 West 168th Street, New York, NY, 10032, USA**USA
JOURNAL: American Journal of Hematology 61 (4): p243-253 Aug., 1999 1999
MEDIUM: print
ISSN: 0361-8609
DOCUMENT TYPE: Article
RECORD TYPE: Abstract
LANGUAGE: English

ABSTRACT: Retroviral-mediated gene transfer into hematopoietic stem cells provides the only means of stable transduction of these cells and their progeny for use with a variety of potentially therapeutic genes. Expression of the Moloney amphotropic retroviral receptor-pit-2 or %%%GLVR%%%-2-is critical to the recognition and entry of Moloney leukemia virus-derived viruses into human target cells such as CD34+ hematopoietic cells. %%%GLVR%%%-2 functions as a sodium-dependent phosphate transporter as well as a receptor. We have previously shown that the expression of the murine homologue of the amphotropic receptor Ram1, also a phosphate transporter, is developmentally regulated in murine hematopoietic fetal liver cells. We also demonstrated that culture of murine fetal liver cells in phosphate-free (PO4-free) medium increases levels of receptor mRNA and makes murine fetal liver cells susceptible to Moloney

amphotropic viral gene transfer. We now examine the effect of culture conditions on the expression ofGLVR-2 in human CD34+ cells. In this report, we demonstrate that there is a 2-3 fold increase in %%%GLVR%%%-2 mRNA levels in CD34+ cells after 3 days in culture with interleukin 3, interleukin 6, and stem-cell factor. In addition, the use of PO4-free medium increases expression of %%%GLVR%%%-2 an additional 2-fold in these cells during this time. These results indicate that %%%GLVR%%%-2 expression can be up-regulated on these cells, and may permit improved retroviral gene transfer efficiencies.

2/7/30
DIALOG(R)File 5:Biosis Previews(R)
(c) 2008 The Thomson Corporation. All rts. reserv.

15057878 BIOSIS NO.: 199900317538
Crystallization and preliminary X-ray analysis of the 6-phospho-alpha-glucosidase from Bacillus subtilis
AUTHOR: Varrot Annabelle; Yamamoto Hiroki; Sekiguchi Junichi; Thompson John ; Davies Gideon J (Reprint)
AUTHOR ADDRESS: Department of Chemistry, University of York, Heslington, York, YO10 5DD, UK**UK
JOURNAL: Acta Crystallographica Section D Biological Crystallography 55 (6): p1212-1214 June, 1999 1999
MEDIUM: print
ISSN: 0907-4449
DOCUMENT TYPE: Article
RECORD TYPE: Abstract
LANGUAGE: English

ABSTRACT: 6-Phospho-alpha-glucosidase (%%%GlvA%%%) is the protein involved in the dissimilation of alpha-glycosides accumulated via a phosphoenolpyruvate-dependent maltose phosphotransferase system (PEP-PTS) in Bacillus subtilis. The purified enzyme has been crystallized in a form suitable for X-ray diffraction analysis. Thin rod-like crystals have been grown by the hanging-drop method in the presence of manganese and NAD. They diffract beyond 2.2 ANG using synchrotron radiation and belong to the space group I222 (or its enantiomorph) with unit-cell dimensions a = 83.26, b = 102.56, c = 145.31 ANG and contain a single molecule of %%%GlvA%%% in the asymmetric unit.

2/7/31
DIALOG(R)File 5:Biosis Previews(R)
(c) 2008 The Thomson Corporation. All rts. reserv.

14891342 BIOSIS NO.: 199900151002
Keratinocyte growth factor stimulates transduction of the respiratory epithelium by retroviral vectors
AUTHOR: Zsengeller Zsuzsanna K; Halbet Christine; Miller A Dusty; Wert Susan E; Whitsett Jeffrey A; Bachurski Cindy J (Reprint)
AUTHOR ADDRESS: Children's Hosp. Med. Cent., Div. Pulmonary Biology, 3333 Burnet Avenue, Cincinnati, OH 45229-3039, USA**USA
JOURNAL: Human Gene Therapy 10 (3): p341-353 Feb. 10, 1999 1999
MEDIUM: print
ISSN: 1043-0342
DOCUMENT TYPE: Article

RECORD TYPE: Abstract
LANGUAGE: English

ABSTRACT: Cell proliferation is required for transduction by standard retrovirus vectors derived from viruses in the murine leukemia virus (MuLV) group. Since proliferation rates are low in the mature pulmonary epithelium, we tested the hypothesis that the efficiency of retrovirus-mediated transduction of respiratory epithelial cells can be enhanced by stimulation of cell proliferation with recombinant human keratinocyte growth factor (rhKGF). A marked increase in proliferation of bronchiolar and alveolar epithelial cells was observed after intratracheal administration of rhKGF (30 mg/kg) to adult FVB/N mice. Two days after rhKGF or saline treatment, 107 AP+ FFU of LAPSN, a recombinant amphotropic retrovirus that expresses human placental alkaline phosphatase (AP), was instilled intratracheally into the mice. Transduction efficiency, measured 2 days after infection, was increased approximately 70-fold by rhKGF pretreatment. However, even after KGF treatment the total numbers of AP-expressing cells were few. Transduction efficiency was similar using either LAPSN packaged by amphotropic host range packaging cells or LAPSN pseudotyped with 10A1 MuLV envelope protein (0.091 +- 0.006 versus 0.094 +- 0.028 transduction events/mm2, respectively). Amphotropic vectors use Pit-2 for cell entry, while 10A1 MuLV vectors can use Pit-1 or Pit-2 for cell entry. By in situ hybridization the retroviral receptor Pit-2 (Ram-1) mRNA was expressed only in the pulmonary vasculature, and Pit-1 (%%%Glvr%%%-1) mRNA was expressed at low levels throughout the lung. In vitro studies demonstrated that retrovirus was inactivated by pulmonary surfactant. Stimulating proliferation of the respiratory epithelium increased retroviral transduction in vivo, but the paucity of retroviral receptors and inactivation by surfactant are additional barriers to high-level retroviral gene transfer in the lung.

2/7/32
DIALOG(R)File 5:Biosis Previews(R)
(c) 2008 The Thomson Corporation. All rts. reserv.

14838856 BIOSIS NO.: 199900098516
Characterization of the human %%%Glvr%%%-1 phosphate transporter/retrovirus receptor gene and promoter region
AUTHOR: Palmer Gaby; Manen Danielle; Bonjour Jean-Philippe; Caverzasio Joseph (Reprint)
AUTHOR ADDRESS: Div. Bone Dis., WHO Collaborating Cent. Osteop. and Bone Dis., Dep. Intern. Med., Univ. Hosp., Geneva, Switzerland**Switzerland
JOURNAL: Gene (Amsterdam) 226 (1): p25-33 Jan. 8, 1999 1999
MEDIUM: print
ISSN: 0378-1119
DOCUMENT TYPE: Article
RECORD TYPE: Abstract
LANGUAGE: English

ABSTRACT: The cell surface receptor for gibbon ape leukemia virus (%%%Glvr%%%-1) belongs to the type III sodium-dependent phosphate transporter/retrovirus receptor gene family. Several observations have suggested an important role for %%%Glvr%%%-1 in regulated Pi handling in bone forming cells and prompted us to investigate further the molecular mechanisms regulating %%%Glvr%%%-1 gene expression. In addition, the

regulation of %%%Glvr%%%-1 gene expression also has potential applications to gene therapy, since retroviral vectors carrying gibbon ape leukemia virus envelope proteins are used for gene delivery into different cell types. The aim of this study was thus to clone the human %%%Glvr%%%-1 gene in order to describe its structure and its promoter region. Our results indicate that the %%%Glvr%%%-1 gene consists of 11 exons and 10 introns spread over 18 kb of genomic DNA. The translation initiation site is located within exon II and the translation stop codon within exon XI. Rapid amplification of cDNA ends (5'-RACE) suggests that, in human SaOS-2 osteoblast-like cells, transcription of %%%Glvr%%%-1 is initiated at multiple sites, mostly located between bp 32 and 50 of the published cDNA sequence, which was initially obtained from HL-60 cells. The 5'-flanking region of the gene is characterized by a very high GC content. Reporter gene assays demonstrate the presence of a functional promoter upstream of exon I and indicate that a GC-rich region, containing two potential SP1 binding sites, is required for high promoter activity in transiently transfected SaOS-2 cells. The description of the human %%%Glvr%%%-1 gene structure, as well as the analysis of some structural and functional characteristics of its promoter region, provide a basis for more detailed investigation of the molecular mechanisms controlling expression of the %%%Glvr%%%-1 gene in bone forming cells and in other cell types.

2/7/33
DIALOG(R)File 5:Biosis Previews(R)
(c) 2008 The Thomson Corporation. All rts. reserv.

14831600 BIOSIS NO.: 199900091260
In vivo expression of transcripts encoding the %%%Glvr%%%-1 phosphate transporter/retrovirus receptor during bone development
AUTHOR: Palmer G; Zhao J; Bonjour J; Hofstetter W; Caverzasio J (Reprint)
AUTHOR ADDRESS: Div. Bone Dis., Dep. Intern. Med., Univ. Geneva, CH-1211 Geneva 14, Switzerland**Switzerland
JOURNAL: Bone (New York) 24 (1): p1-7 Jan., 1999 1999
MEDIUM: print
ISSN: 8756-3282
DOCUMENT TYPE: Article
RECORD TYPE: Abstract
LANGUAGE: English

ABSTRACT: In vitro observations suggest that inorganic phosphate (Pi) transport plays an important functional role in osteogenic cells and in their matrix vesicles for the initiation of matrix calcification. Recent studies have shown that the type III sodium-dependent Pi transporters, %%%Glvr%%%-1 and %%%Glvr%%%-2, are expressed in human osteoblast-like cells and have suggested a potential role for type III transporters in regulated Pi handling in osteogenic cells. To address the relevance of these findings in the context of bone formation in vivo and, in particular, in relation to matrix calcification, we investigated expression of the %%%Glvr%%%-1 transporter by in situ hybridization in developing embryonic murine metatarsals, using human %%%Glvr%%%-1 cDNA as a probe. In this model of endochondral ossification, expression of transcripts encoding %%%Glvr%%%-1 could be detected from day 17 of embryonic development. A hybridization signal for %%%Glvr%%%-1 was specifically observed in a subset of hypertrophic chondrocytes and could not be detected in osteoblasts. The expression of %%%Glvr%%%-1 mRNA was

compared with that of transcripts encoding extracellular matrix proteins. %%%Glvr%%%-1 mRNA expression was confined to a population of early hypertrophic chondrocytes expressing type X collagen and to slightly more mature cells that express transcripts encoding osteopontin but lack type X collagen mRNA. No %%%Glvr%%%-1 transcripts were detected in fully differentiated hypertrophic chondrocytes. This pattern of %%%Glvr%%%-1 mRNA expression was maintained throughout embryonic development until after birth. In conclusion, the %%%Glvr%%%-1 phosphate transporter is selectively expressed in a subset of hypertrophic chondrocytes during endochondral bone formation, in a region where matrix mineralization proceeds. This observation represents the first in vivo evidence consistent with a potential role for this phosphate transporter in matrix calcification.

2/7/34
DIALOG(R)File 5:Biosis Previews(R)
(c) 2008 The Thomson Corporation. All rts. reserv.

14701685 BIOSIS NO.: 199800495932
Differential expression, abundance, and regulation of Na+-phosphate cotransporter genes in murine kidney
AUTHOR: Tenenhouse Harriet S (Reprint); Roy Stephane; Martel Josee; Gauthier Claude
AUTHOR ADDRESS: Univ.-Montreal Child. Hosp., 2300 Tupper St., Montreal, PQ H3H 1P3, Canada**Canada
JOURNAL: American Journal of Physiology 275 (4 PART 2): pF527-F534 Oct., 1998 1998
MEDIUM: print
ISSN: 0002-9513
DOCUMENT TYPE: Article
RECORD TYPE: Abstract
LANGUAGE: English

ABSTRACT: Three classes of high-affinity Na+-Pi cotransporters are expressed in mammalian kidney. These include Npt1 (type 1), Npt2 (type II), and the cellular receptors for gibbon ape leukemia virus (%%%Glvr%%%-1) and amphotropic murine retrovirus (Ram-1) (type III). We defined the tissue distribution as well as the relative renal abundance of Npt1, Npt2, %%%Glvr%%%-1, and Ram-1 mRNAs and examined the effects of low-Pi diet, the Hyp mutation, and growth hormone (GH) on their renal expression by ribonuclease protection assay. In normal mouse kidney, Npt1, Npt2, %%%Glvr%%%-1, and Ram-1 accounted for 15 + 1.0, 84 + 1.0, 0.5 + 0.2, and 0.5 + 0.3% of total Na+-Pi cotransporter mRNAs, respectively. Evidence was obtained for low-abundance Npt1 mRNA expression in liver and Npt2 mRNA expression in intestine, whereas %%%Glvr%%%-1 and Ram-1 mRNAs were also detected in bone, intestine, heart, and liver. Npt2 mRNA was localized to proximal tubules in the renal outer cortex, whereas %%%Glvr%%%-1 transcripts were detected throughout the kidney by in situ hybridization. The Hyp mutation elicited a significant reduction in renal Npt1 and Npt2 mRNAs (78 + 8 and 57 + 3% of normal, respectively), whereas neither low-Pi diet nor GH influenced the renal abundance of Npt1 and Npt2 transcripts. Renal %%%Glvr%%%-1 mRNA expression was significantly increased in Hyp mice and GH-treated mice (145 +- 6 and 165 +- 5% of control, respectively), whereas the renal abundance of Ram-1 transcript was unaffected by either the Hyp mutation, low-Pi diet, or GH treatment. In summary, we demonstrate that Npt2 is the predominant Na+-Pi

cotransporter in mouse kidney, that Npt2 and %%%Glvr%%%-1 have distinct patterns of renal expression, and that the Hyp mutation modulates the renal expression of Npt1, Npt2, and %%%Glvr%%%-1 mRNAs. Our results suggest that increased renal %%%Glvr%%%-1 mRNA may contribute to GH stimulation of renal Na+-Pi cotransport.

2/7/35
DIALOG(R)File 5:Biosis Previews(R)
(c) 2008 The Thomson Corporation. All rts. reserv.

14696649 BIOSIS NO.: 199800490896
The gene %%%glvA%%% of Bacillus subtilis 168 encodes a metal-requiring, NAD(H)-dependent 6-phospho-alpha-glucosidase: Assignment to family 4 of the glycosylhydrolase superfamily
AUTHOR: Thompson John (Reprint); Pikis Andreas; Ruvinov Sergei B; Henrissat Bernard; Yamamoto Hiroki; Sekiguchi Junichi
AUTHOR ADDRESS: NIDR Natl. Inst. Health, Build. 30 Room 528, Convent Dr., MSC-4350, Bethesda, MD 20892, USA**USA
JOURNAL: Journal of Biological Chemistry 273 (42): p27347-27356 Oct. 16, 1998 1998
MEDIUM: print
ISSN: 0021-9258
DOCUMENT TYPE: Article
RECORD TYPE: Abstract
LANGUAGE: English

ABSTRACT: The gene %%%glvA%%% (formerly glv-1) from Bacillus subtilis has been cloned and expressed in Escherichia coli. The purified protein %%%GlvA%%% (449 residues, Mr = 50,513) is a unique 6-phosphoryl-O-alpha-D-glucopyranosyl:phosphoglucohydrolase (6-phospho-alpha-glucosidase) that requires both NAD(H) and divalent metal (Mn2+, Fe2+, Co2+ or Ni2+) for activity. 6-Phospho-alpha-glucosidase (EC 3.2.1.122) from B. subtilis cross-reacts with polyclonal antibody to maltose 6-phosphate hydrolase from Fusobactergum mortiferum, and the two proteins exhibit amino acid sequence identity of 73%. Estimates for the Mr of %%%GlvA%%% determined by SDS-polyacrylamide gel electrophoresis (51,000) and electrospray-mass spectroscopy (50,510) were in excellent agreement with the molecular weight of 50,513 deduced from the amino acid sequence. The sequence of the first 37 residues from the N terminus determined by automated analysis agreed precisely with that predicted by translation of %%%glvA%%%. The chromogenic and fluorogenic substrates, p-nitrophenyl-alpha-D-glucopyranoside 6-phosphate and 4-methylumbelliferyl-alphaD-glucopyranoside 6-phosphate were used for the discontinuous assay and in situ detection of enzyme activity, respectively. Site-directed mutagenesis shows that three acidic residues, Asp41, Glu111, and Glu359, are required for %%%GlvA%%% activity. Asp41 is located at the C terminus of a betaalphabeta fold that may constitute the dinucleotide binding domain of the protein. Glu111 and Glu359 may function as the catalytic acid (proton donor) and nucleophile (base), respectively, during hydrolysis of 6-phospho-alpha-glucoside substrates including maltose 6-phosphate and trehalose 6-phosphate. In metal-free buffer, %%%GlvA%%% exists as an inactive dimer, but in the presence of Mn2+ ion, these species associate to form the NAD(H)-dependent catalytically active tetramer. By comparative sequence alignment with its homologs, the novel 6-phospho-alpha-glucosidase from R. subtilis can be

assigned to the nine-member family 4 of the glycosylhydrolase superfamily.

2/7/36
DIALOG(R)File 5:Biosis Previews(R)
(c) 2008 The Thomson Corporation. All rts. reserv.

14673238 BIOSIS NO.: 199800467485
Expression of %%%GLVR%%%-1 and %%%GLVR%%%-2 on human CD34+CD38- bone marrow cells following co-culture with porcine microvascular endothelial cells (PMVEC) and liquid culture with PMVEC-CM
AUTHOR: Kaushal S; St Louis D; Saini A A; Wells M; Clark W; Smoot D; Harlan D M; Davis T A; Chute J P
AUTHOR ADDRESS: Naval Med. Res. Inst., Uniformed Serv. Univ. Health Sci., Bethesda, MD, USA**USA
JOURNAL: Experimental Hematology (Charlottesville) 26 (8): p761 Aug., 1998 1998
MEDIUM: print
CONFERENCE/MEETING: 27th Annual Meeting of the International Society for Experimental Hematology Vancouver, British Columbia, Canada August 1-5, 1998; 19980801
SPONSOR: International Society for Experimental Hematology
ISSN: 0301-472X
DOCUMENT TYPE: Meeting; Meeting Abstract; Meeting Poster
RECORD TYPE: Citation
LANGUAGE: English

2/7/37
DIALOG(R)File 5:Biosis Previews(R)
(c) 2008 The Thomson Corporation. All rts. reserv.

14441715 BIOSIS NO.: 199800235962
Na+-Phosphate cotransport in mouse distal convoluted tubule cells: Evidence for %%%Glvr%%%-1 and Ram-1 gene expression
AUTHOR: Tenenhouse Harriet S (Reprint); Gauthier Claude; Martel Josee; Gesek Frank A; Coutermarsh Bonita A; Friedman Peter A
AUTHOR ADDRESS: Montreal Children's Hosp., 2300 Tupper St., Montreal, PQ H3H 1P3, Canada**Canada
JOURNAL: Journal of Bone and Mineral Research 13 (4): p590-597 April, 1998 1998
MEDIUM: print
ISSN: 0884-0431
DOCUMENT TYPE: Article
RECORD TYPE: Abstract
LANGUAGE: English

ABSTRACT: While there is considerable evidence for phosphate (Pi) reabsorption in the distal tubule, Pi transport and its regulation have not been well characterized in this segment of the nephron. In the present study, we examined Na+-dependent Pi transport in immortalized mouse distal convoluted tubule (MDCT) cells. Pi uptake by MDCT cells is Na+-dependent and, under initial rate conditions, is inhibited by phosphonoformic acid (41 +- 3% of control), a competitive inhibitor of Na+-Pi cotransport. The transport system has a high affinity for Pi (Km = 0.46 mM) and is stimulated by lowering the extracellular pH from 7.4 to

6.4 and inhibited by raising the pH from 7.4 to 8.4. Exposure to Pi-free medium for 21 h increased Na+-Pi cotransport from 2.1 to 5.5 nmol/mg of protein/5 minutes ($p < 0.05$) while parathyroid hormone, forskolin, and phorbol 12-myristate 13-acetate failed to alter Pi uptake in MDCT cells. Reverse transcriptase polymerase chain reaction of MDCT cell RNA provided evidence for the expression of the Npt1 but not the Npt2 Na+-Pi cotransporter gene. However, preincubation of MDCT cells with Npt1 antisense oligonucleotide led to only 20% inhibition of Na+-Pi cotransport, suggesting that other Na+-Pi cotransporters are operative in MDCT cells. Indeed, we showed, by ribonuclease protection assay, that MDCT cells express the ubiquitous cell surface receptors for gibbon ape leukemia virus (%%%Glvr%%%-1) and amphoteric murine retrovirus (Ram-1) that also function as Na+-Pi cotransporters. In summary, we demonstrate that the pH dependence and regulation of Na+-Pi cotransport in MDCT cells is distinct from that in the proximal tubule and suggest that different gene products mediate Na+-Pi cotransport in the proximal and distal segments of the nephron.

2/7/38
DIALOG(R)File 5:Biosis Previews(R)
(c) 2008 The Thomson Corporation. All rts. reserv.

14371342 BIOSIS NO.: 199800165589
Bone marrow stromal cells as targets for gene therapy of hemophilia A
AUTHOR: Chuah Marinee K L (Reprint); Brems Hilde; Vanslembrouck Veerle; Collen Desire; Vandendriessche Thierry
AUTHOR ADDRESS: Retroviral Gene Transfer Sect., Cent. Transgene Technol. Gene Ther., Flanders Interuniversity Inst. Biotechnol., Univ. Leuven, Building O and N, Herestraat 49, Leuven B-3000, Belgium**Belgium
JOURNAL: Human Gene Therapy 9 (3): p353-365 Feb. 10, 1998 1998
MEDIUM: print
ISSN: 1043-0342
DOCUMENT TYPE: Article
RECORD TYPE: Abstract
LANGUAGE: English

ABSTRACT: Attempts to develop an ex vivo gene therapy strategy for hemophilia A, using either primary T cells or bone marrow (BM) stem/progenitor cells have been unsuccessful, due to the inability of these cell types to express coagulation factor VIII (FVIII). As an alternative, we evaluated the potential of BM-derived stromal cells which can be readily obtained and expanded in vitro. Human and murine BM stromal cells were transduced with an intron-based Moloney murine leukemia virus (MoMLV) retroviral vector expressing a B-domain-deleted human factor VIII cDNA (designated as MFG-FVIIIDELTAB). Transduction efficiencies were increased 10- to 15-fold by phosphate depletion and centrifugation, which obviated the need for selective enrichment of the transduced BM stromal cells. This resulted in high FVIII expression levels in transduced human (180 +- 4 ng FVIII/106 cells per 24 hr) and mouse (900 +- 130 ng FVIII/106 cells per 24 hr) BM stromal cells. Pseudotyping of the MFG-FVIIIDELTAB retroviral vectors with the gibbon ape leukemia virus envelope (GALV-env) resulted in significantly higher transduction efficiencies (100 +- 20%) and FVIII expression levels (390 +- 10 ng FVIII/106 cells per 24 hr) in transduced human BM stromal cells than with standard amphotropic vectors. This difference in transduction efficiency correlated with the higher titer of the GALV-env pseudotyped

viral vectors and with the higher GALV receptor (%%%GLVR%%%-1) versus amphotropic receptor (%%%GLVR%%%-2) mRNA expression levels in human BM stromal cells. These findings demonstrate the potential of BM stromal cells for gene therapy in general and hemophilia A in particular.

2/7/39
DIALOG(R)File 5:Biosis Previews(R)
(c) 2008 The Thomson Corporation. All rts. reserv.

14322086 BIOSIS NO.: 199800116333
Immunodetection of a type III sodium-dependent phosphate cotransporter in tissues and OK cells
AUTHOR: Boyer Christian J; Baines Andrew D; Beaulieu Edith; Beliveau Richard (Reprint)
AUTHOR ADDRESS: Lab. d'Oncol. Mol., Membrane Transport Res. Group, Universite du Quebec a Montreal-Hopital Ste-Justine, P.O. Box 8888, Centre-Ville Stn., Montreal, PQ H3C 3P8, Canada**Canada
JOURNAL: Biochimica et Biophysica Acta 1368 (1): p73-83 Jan. 5, 1998 1998
MEDIUM: print
ISSN: 0006-3002
DOCUMENT TYPE: Article
RECORD TYPE: Abstract
LANGUAGE: English

ABSTRACT: Polyclonal antibodies were raised in rabbits against a 14-amino acid portion of the gibbon ape leukemia virus human membrane receptor %%%Glvr%%%-1. This epitope also contained seven amino acids common to the receptor for the amphotropic murine retrovirus Ram-1. Antibody specificity and molecular size of %%%Glvr%%%-1/Ram-1-related proteins were assayed by Western blot. Using a standard Laemmli buffer system, under reducing conditions, a single band of approximately 85 kDa (designated p85) was immunodetected in membranes prepared from opossum kidney (OK) cells and in brain membranes from rat, rabbit and hamster. In mouse brain, p85 as well as a protein of 70-72 kDa were immunodetected. This protein was also present in several other mouse tissues. Limited proteolysis of p85 and the 70-72 kDa-protein from mouse yielded similar peptide fragments, suggesting that both proteins are related. Fragments of the same molecular masses were also detected in OK cell membranes following proteolysis, showing that p85 in both models (mouse brain and OK cell) share a similar sequence. p85 is not N-glycosylated since an assay using endoglycosidase F/N-glycosidase F did not alter the electrophoretic mobility of p85. We also observed that regulation of phosphate transport by incubating OK cells without any phosphate or by PTH treatment occurs without any changes in the amount of p85. In conclusion, these data demonstrate for the first time a Western blot detection of a type III phosphate transporter using polyclonal antibodies. They also suggest that, conversely to type I and type II phosphate transporters which are localized in the kidney, this third type of transporter is ubiquitous and probably absorbs the readily available phosphate from interstitial fluid for normal cellular functions in many species and tissues, serving as a housekeeping Na+/Pi cotransport system. This is also the first report showing that p85 is not regulated in the same manner as type II phosphate transporters.

2/7/40

DIALOG(R)File 5:Biosis Previews(R)
(c) 2008 The Thomson Corporation. All rts. reserv.

14272570 BIOSIS NO.: 199800066817
Up-regulation of the human amphotropic receptor, %%%GLVR%%%-2 in human CD34+ cells
AUTHOR: Kaubisch A (Reprint); Ward M; Hesdorffer C; Bank A
AUTHOR ADDRESS: Columbia Univ. Coll. Physicians Surgeons, Dep. Med., New York, NY, USA**USA
JOURNAL: Blood 90 (10 SUPPL. 1 PART 1): p117A Nov. 15, 1997 1997
MEDIUM: print
CONFERENCE/MEETING: 39th Annual Meeting of the American Society of Hematology San Diego, California, USA December 5-9, 1997; 19971205
SPONSOR: The American Society of Hematology
ISSN: 0006-4971
DOCUMENT TYPE: Meeting; Meeting Abstract; Meeting Poster
RECORD TYPE: Citation
LANGUAGE: English

2/7/41
DIALOG(R)File 5:Biosis Previews(R)
(c) 2008 The Thomson Corporation. All rts. reserv.

14251559 BIOSIS NO.: 199800045806
Expression of a newly identified phosphate transporter/retrovirus receptor in human SaOS-2 osteoblast-like cells and its regulation by insulin-like growth factor I
AUTHOR: Palmer Gaby; Bonjour Jean-Philippe; Caverzasio Joseph (Reprint)
AUTHOR ADDRESS: Div. Bone Dis., Dep. Med., Univ. Geneva, CH-1211 Geneva 14, Switzerland**Switzerland
JOURNAL: Endocrinology 138 (12): p5202-5209 Dec., 1997 1997
MEDIUM: print
ISSN: 0013-7227
DOCUMENT TYPE: Article
RECORD TYPE: Abstract
LANGUAGE: English

ABSTRACT: The cell surface receptor for gibbon ape leukemia virus (%%%Glvr%%%-1) was recently demonstrated to serve normal cellular functions as a sodium-dependent phosphate (NaPi) transporter. This protein belongs to a newly identified phosphate transporter/retrovirus receptor gene family distinct from renal type I and II NaPi transporters. Although inorganic phosphate (Pi) transport is an important function of osteoblasts and of the matrix vesicles produced by these cells in the context of bone matrix calcification, the molecular identity of the NaPi transport system(s) present in this cell type is still unknown. In contrast to Pi uptake mediated by renal NaPi transporters, the activities of both the osteoblastic transport system and %%%Glvr%%%-1 are decreased at alkaline pH, and this observation led us to investigate expression of this transporter in human SaOS-2 osteosarcoma cells. Northern blotting analysis revealed the presence of a 4-kilobase %%%Glvr%%%-1 transcript. The expression of %%%Glvr%%%-1 messenger RNA (mRNA) was increased in response to insulin-like growth factor I (IGF-I). Associated with this effect, a selective, dose- and time-dependent stimulation of NaPi transport was observed. Actinomycin D and cycloheximide abolished the increase in NaPi transport, which thus appeared to be dependent on RNA

and protein synthesis. The increase in %%%Glvr%%%-1 mRNA induced by IGF-I was dose dependent and transient, peaking after 4 h (apprx 4-fold increase in response to 10-7 M IGF-I). It preceded the maximal expression of NaPi transport stimulation (173-235% of control), which was observed after 18-24 h. Induction of %%%Glvr%%%-1 mRNA expression by IGF-I was inhibited by actinomycin D, suggesting that this effect was related to an increase in gene transcription. The stability of %%%Glvr%%%-1 mRNA was not altered by IGF-I, and %%%Glvr%%%-1 mRNA induction did not require the synthesis of new proteins. These data demonstrate for the first time regulated expression of mRNA encoding the type III NaPi transporter %%%Glvr%%%-1 in osteoblast-like cells. They also suggest that this new transporter family may be involved in Pi handling in osteogenic cells and in its regulation by osteotropic factors.

2/7/42
DIALOG(R)File 5:Biosis Previews(R)
(c) 2008 The Thomson Corporation. All rts. reserv.

14240562 BIOSIS NO.: 199800034809
Relative contributions of Na+-dependent phosphate co-transporters to phosphate transport in mouse kidney: RNase H-mediated hybrid depletion analysis
AUTHOR: Miyamoto Ken-Ichi (Reprint); Segawa Hiroko; Morita Kyoko; Nii Tomoko; Tatsumi Sawako; Taketani Yutaka; Takeda Eiji
AUTHOR ADDRESS: Dep. Clinical Nutr., Sch. Med., Tokushima Univ., Kuramoto-Cho 3, Tokushima 770, Japan**Japan
JOURNAL: Biochemical Journal 327 (3): p735-739 Nov. 1, 1997 1997
MEDIUM: print
ISSN: 0264-6021
DOCUMENT TYPE: Article
RECORD TYPE: Abstract
LANGUAGE: English

ABSTRACT: Reabsorption of Pi in the proximal tubule of the kidney is an important determinant of Pi homoeostasis. At least three types (types I-III) of high-affinity Na+-dependent Pi co-transporters have been identified in mammalian kidneys. The relative roles of these three types of Na+/Pi co-transporters in Pi transport in mouse kidney cortex have now been investigated by RNase H-mediated hybrid depletion. Whereas isolated brush-border membrane vesicles showed the presence of two kinetically distinct Na+/Pi co-transport systems (high Km-low Vmax and low Km-high Vmax), Xenopus oocytes, microinjected with polyadenylated (poly(A)+) RNA from mouse kidney cortex, showed only the high-affinity Pi uptake system. Kidney poly(A)+ RNA was incubated in vitro with antisense oligonucleotides corresponding to Npt-1 (type I), NaPi -7 (type II) or %%%Glvr%%%-1 (type III) Na+/Pi co-transporter mRNAs, and then with RNase H. Injection of such treated RNA preparations into Xenopus oocytes revealed that an NaPi-7 antisense oligonucleotide that resulted in complete degradation of NaPi-7 mRNA (as revealed by Northern blot analysis), also induced complete inhibition of Pi uptake. Degradation of Npt-1 or %%%Glvr%%%-1 mRNAs induced by corresponding antisense oligonucleotides had no effect on Pi transport, which was subsequently measured in oocytes. These results indicate that the type II Na+/Pi co-transporter NaPi-7 mediated most Na+-dependent Pi transport in mouse kidney cortex.

2/7/43
DIALOG(R)File 5:Biosis Previews(R)
(c) 2008 The Thomson Corporation. All rts. reserv.

13930971 BIOSIS NO.: 199799565031
The amphotropic murine leukemia virus receptor gene encodes a 71-kilodalton protein that is induced by phosphate depletion
AUTHOR: Chien Mei-Ling; Foster John L; Douglas Janet L; Garcia J Victor (Reprint)
AUTHOR ADDRESS: Dep. Virology Molecular Biol., St. Jude Children's Res. Hosp., 332 N. Lauderdale, Memphis, TN 38105, USA**USA
JOURNAL: Journal of Virology 71 (6): p4564-4570 1997 1997
ISSN: 0022-538X
DOCUMENT TYPE: Article
RECORD TYPE: Abstract
LANGUAGE: English

ABSTRACT: The amphotropic murine leukemia virus (MULV) can infect cells from a number of mammals, including humans, via its specific receptor. Basic knowledge of amphotropic MuLV receptor expression is likely to be useful in the development and improvement of gene therapy protocols based on amphotropic-pseudotyped vectors. To investigate the expression of the human receptor for the amphotropic MuLV (%%%GLVR%%%-2, newly termed Pit2), we determined its mRNA levels in several cell lines and found them to vary significantly. Induction of increased levels of mRNA after removal of phosphate from the media was observed in two osteosarcoma cell lines. The increase in %%%GLVR%%%-2 mRNA resulted in a concomitant rise in the levels of a 71-kDa protein specifically recognized by affinity-purified antibodies against %%%GLVR%%%-2. Using these antibodies, we were able to confirm the intracellular topology of the large hydrophilic domain between the proposed sixth and seventh transmembrane domains of the %%%GLVR%%%-2 protein. This assignment is in agreement with the fourth extracellular loop being outside the cell, consistent with the proposal that the fourth extracellular loop of %%%GLVR%%%-2 contains the envelope binding site.

2/7/44
DIALOG(R)File 5:Biosis Previews(R)
(c) 2008 The Thomson Corporation. All rts. reserv.

13500120 BIOSIS NO.: 199699134180
Retrovirus packaging cells based on 10A1 murine leukemia virus for production of vectors that use multiple receptors for cell entry
AUTHOR: Miller A Dusty (Reprint); Chen Feng
AUTHOR ADDRESS: Fred Hutchinson Cancer Res. Cent., 1100 Fairview Ave. N., Rm. C2-023, Seattle, WA 98109, USA**USA
JOURNAL: Journal of Virology 70 (8): p5564-5571 1996 1996
ISSN: 0022-538X
DOCUMENT TYPE: Article
RECORD TYPE: Abstract
LANGUAGE: English

ABSTRACT: 10A1 murine leukemia virus can enter cells by using either of two different cell surface phosphate transport proteins, the gibbon ape leukemia virus receptor %%%Glvr%%%-1 (Pit-1) or the amphotropic

retrovirus receptor Ram-1 (Pit-2). %%%Glvr%%%-1 and Ram-1 are widely expressed in different tissues, but the relative amounts of each are highly variable. We have developed retrovirus packaging cell lines based on 10A1 virus to take advantage of this dual receptor utilization to improve gene transfer rates in somatic cells of animals and humans, in which the relative levels of the two receptors are not always known. Optimization of the Env expression vector allowed the generation of packaging lines that produce helper-free vector titers up to 10-7/ml. By interference analysis, we found that a 10A1 pseudotype retroviral vector can utilize Ram-1 for efficient entry into mouse, rat, and human cells and can utilize %%%Glvr%%%-1 for entry into mouse and human cells but not for entry into rat cells. The 10A1 pseudotype vector efficiently enters mouse cells by using %%%Glvr%%%-1, while entry into human cells is much less efficient. Thus, the 10A1 pseudotype packaging cells may be advantageous compared with the standard amphotropic packaging cells because vectors produced by the cells can use an additional receptor for cell entry. These packaging cells will also be useful to further explore the complicated pattern of receptor usage conferred by the 10A1 viral surface protein.

2/7/45
DIALOG(R)File 5:Biosis Previews(R)
(c) 2008 The Thomson Corporation. All rts. reserv.

13344741 BIOSIS NO.: 199698812574
Expression of %%%GLVR%%%-1 and %%%GLVR%%%-2 on human lymphocytes: Relationship to retroviral mediated gene transduction
AUTHOR: Lam J S; Cowherd R; Rosenberg S A; Hwu P
AUTHOR ADDRESS: Surgery Branch, NCI, NIH, Bethesda, MD 20892, USA**USA
JOURNAL: Proceedings of the American Association for Cancer Research Annual Meeting 37 (0): p343 1996 1996
CONFERENCE/MEETING: 87th Annual Meeting of the American Association for Cancer Research Washington, D.C., USA April 20-24, 1996; 19960420
ISSN: 0197-016X
DOCUMENT TYPE: Meeting; Meeting Abstract; Meeting Poster
RECORD TYPE: Citation
LANGUAGE: English

2/7/46
DIALOG(R)File 5:Biosis Previews(R)
(c) 2008 The Thomson Corporation. All rts. reserv.

13317144 BIOSIS NO.: 199698784977
Identification and characterization of a widely expressed phosphate transporter/retrovirus receptor family
AUTHOR: Kavanaugh Michael P (Reprint); Kabat David
AUTHOR ADDRESS: Vollum Inst., Oregon Health Sci. Univ., Portland, OR 97201, USA**USA
JOURNAL: Kidney International 49 (4): p959-963 1996 1996
ISSN: 0085-2538
DOCUMENT TYPE: Article
RECORD TYPE: Abstract
LANGUAGE: English

ABSTRACT: The cell-surface receptors for gibbon ape leukemia virus (

%%%Glvr%%%-1; (1)) and rat amphotropic virus (Ram-1; (2)) were recently demonstrated to serve normal cellular functions as sodium-dependent phosphate transporters (3, 4). These transporters, called PiT-1 and PiT-2, respectively, are approximately 59% identical in amino acid sequence and are members of a gene family distinct from the renal type I and type II NaP-i sodium-dependent phosphate transporters. Both PiT-1 and PiT-2 are widely distributed in many tissues including kidney, brain, heart, liver, muscle, and bone marrow. Expression of both transporters is increased by phosphate deprivation. The distinct structural and functional properties of these molecules establishes them as members of a new family of phosphate transporters which may play a major role in phosphate uptake in a wide variety of cell types.

2/7/47
DIALOG(R)File 5:Biosis Previews(R)
(c) 2008 The Thomson Corporation. All rts. reserv.

12907964 BIOSIS NO.: 199598375797
Enhancement of retrovirus-mediated gene transduction efficiency by transient overexpression of the amphotropic receptor, %%%GLVR%%%-2
AUTHOR: Yamaguchi Satoshi; Wakimoto Hiroaki; Yoshida Yoko; Kanegae Yumi; Saito Izumo; Aoyagi Masaru; Hirakawa Kimiyoshi; Amagasa Teruo; Hamada Hirofumi (Reprint)
AUTHOR ADDRESS: Dep. Mol. Biotherapy Res., Cancer Chemotherapy Cent., Japanese Foundation Cancer Res., 1-37-1 Kami-Ikebukuro, Toshima-ku, Tokyo 170, Japan**Japan
JOURNAL: Nucleic Acids Research 23 (11): p2080-2081 1995 1995
ISSN: 0305-1048
DOCUMENT TYPE: Article
RECORD TYPE: Citation
LANGUAGE: English

2/7/48
DIALOG(R)File 5:Biosis Previews(R)
(c) 2008 The Thomson Corporation. All rts. reserv.

12590307 BIOSIS NO.: 199598058140
A family of retroviruses that utilize related phosphate transporters for cell entry
AUTHOR: Miller Daniel G; Miller A Dusty (Reprint)
AUTHOR ADDRESS: Fred Hutchinson Cancer Res. Cent., 1124 Columbia St., Seattle, WA 98104, USA**USA
JOURNAL: Journal of Virology 68 (12): p8270-8276 1994 1994
ISSN: 0022-538X
DOCUMENT TYPE: Article
RECORD TYPE: Abstract
LANGUAGE: English

ABSTRACT: The amphotropic murine retrovirus receptor Ram-1 shows significant sequence similarity to the gibbon ape leukemia virus (GALV) receptor %%%Glvr%%%-1, and both of these cell surface virus receptors normally function as sodium-dependent phosphate symporters. However, Ram-1 from humans or rats does not serve as a receptor for GALV, and %%%Glvr%%%-1 from humans does not serve as a receptor for amphotropic virus. Here we show the murine retrovirus 10A1 can enter cells by using

either %%%Glvr%%%-1 or Ram-1. Furthermore, we have constructed Ram-1/%%%Glvr%%%-1 hybrid receptors that allow entry of both GALV and amphotropic virus. While GALV and amphotropic virus are in separate interference groups when assayed on human cells, they do interfere with each other in cells expressing the hybrid receptor. These results indicate a close functional relationship between retroviruses that utilize members of this newly defined receptor family and provide a molecular explanation for nonreciprocal and cell type-specific interference observed for some retrovirus classes.

2/7/49
DIALOG(R)File 5:Biosis Previews(R)
(c) 2008 The Thomson Corporation. All rts. reserv.

12537612 BIOSIS NO.: 199598005445
Increased gene transfer into human hematopoietic progenitor cells by extended in vitro exposure to a pseudotyped retroviral vector
AUTHOR: Von Kalle Christof (Reprint); Kiem Hans-Peter; Goehle Sondra; Darovsky Boris; Heimfeld Shelly; Torok-Storb Beverly; Storb Rainer; Schuening Friedrich G
AUTHOR ADDRESS: Fred Hutchinson Cancer Res. Cent., 1124 Columbia Street, M318, Seattle, WA 98104-2092, USA**USA
JOURNAL: Blood 84 (9): p2890-2897 1994 1994
ISSN: 0006-4971
DOCUMENT TYPE: Article
RECORD TYPE: Abstract
LANGUAGE: English

ABSTRACT: Retroviral-mediated gene transfer is the most attractive modality for gene transfer into hematopoietic stem cells. However, transduction efficiency has been low using amphotropic Moloney murine leukemia virus (MoMLV) vectors. In this study, we investigated modifications of gene transfer using amphotropic MoMLV vectors in cell-free supernatant for their ability to increase the currently low transduction of both committed hematopoietic progenitors, granulocyte-macrophage colony-forming units (CFU-GMs), and their precursors, long-term culture-initiating cells (LTC-IC). First, based on the observation that bone marrow cells express more gibbon ape leukemia virus (GALV) receptor (%%%Glvr%%%-1) than amphotropic receptor (Ram-1), PG13/LN, which is a MoMLV vector pseudotyped with the GALV envelope, was compared with the analogous amphotropic envelope vector (PA317/N). Second, progenitor cell transduction efficiency was compared between CD34 enriched and nonenriched progenitor populations. Third, the duration of transduction in vitro was extended to increase the proportion of progenitor cells that entered cell cycle and could thereby integrate vector cDNA. In 20 experiments, 1 times 10-6 marrow or peripheral blood mononuclear cells (PBMCs)/mL were exposed to identical titers of pseudotyped PG13/LN vector or PA317/LN vector in the presence of recombinant human interleukin-1 (IL-1), IL-3, IL-6, and stem call factor (SCF; c-kit ligand) for 5 days. 50% of fresh vector supernatant was refed daily. Hematopoietic progenitor cells as measured by G418-resistant granulomonocytic colony (CFU-GM) formation were transduced more effectively with PG13/LN (19.35%) than with PA317/LN (11.5%, P = .012). In 11 further experiments, enrichment of CD34 antigen positive cells significantly improved gene transfer from 13.9% G418-resistant CFU-GM in nonenriched to 24.9% in CD34-enriched progenitor cells (P lt .01). To analyze gene transfer after extended

growth factor-supported long-term culture, 1 times 10-6 marrow cells/mL were cultured with IL-1, IL-3, IL-6, and SCF (50 ng/mL each) for 1, 2, and 3 weeks. Fifty percent of PG13/LN supernatant with growth factors was refed on 5 days per week. Five percent of marrow CFU-GM and 67% of LTC-IC were G418 resistant at 1 week (n = 4), 60% of CFU-GM and 100% of LTC-IC were resistant at 2 weeks (n = 2) and 74% of CFU-GM (n = 4) and 82% of LTC-IC (n = 2) were resistant at three weeks. These data suggest that the efficiency of human hematopoietic progenitor cell transduction can be significantly improved by using the GALV-pseudotyped PG13/LN vector, enriching for CD34+ cells and extending the transduction culture in the presence of IL-1, IL-3, IL-6, SCF, and PG13/LN vector.

2/7/50
DIALOG(R)File 5:Biosis Previews(R)
(c) 2008 The Thomson Corporation. All rts. reserv.

12398856 BIOSIS NO.: 199497420141
Cell-surface receptors for gibbon ape leukemia virus and amphotropic murine retrovirus are inducible sodium-dependent phosphate symporters
AUTHOR: Kavanaugh Michael P; Miller Daniel G; Zhang Weibin; Law Wendy; Kozak Susan L; Kabat David; Miller A Dusty (Reprint)
AUTHOR ADDRESS: Fred Hutchinson Cancer Res. Cent., 1124 Columbia St., Seattle, WA 98104, USA**USA
JOURNAL: Proceedings of the National Academy of Sciences of the United States of America 91 (15): p7071-7075 1994 1994
ISSN: 0027-8424
DOCUMENT TYPE: Article
RECORD TYPE: Abstract
LANGUAGE: English

ABSTRACT: Cell surface receptors for gibbon ape leukemia virus (%%%Glvr%%%-1) and murine amphotropic retrovirus (Ram-1) are distinct but related proteins having multiple membrane-spanning regions. Distant homology with a putative phosphate permease of Neurospora crassa suggested that these receptors might serve transport functions. By expression in Xenopus laevis oocytes and in mammalian cells, we have identified %%%Glvr%%%-1 and Ram-1 as sodium-dependent phosphate symporters. Two-electrode voltage-damp analysis indicates net cation influx, suggesting that phosphate is transported with excess sodium ions. Phosphate uptake was reduced by gt 50% in mouse fibroblasts expressing amphotropic envelope glycoprotein, which binds to Ram-1, indicating that Ram-1 is a major phosphate transporter in these cells. RNA analysis shows wide but distinct tissue distributions, with %%%Glvr%%%-1 expression being highest in bone marrow and Ram-1 in heart. Overexpression of Ram-1 severely repressed %%%Glvr%%%-1 synthesis in fibroblasts, suggesting that transporter expression may be controlled by net phosphate accumulation. Accordingly, depletion of extracellular phosphate increased Ram-1 and %%%Glvr%%%-1 expression 3- to 5-fold. These results suggest simple methods to modulate retroviral receptor expression, with possible applications to human gene therapy.

2/7/51
DIALOG(R)File 5:Biosis Previews(R)
(c) 2008 The Thomson Corporation. All rts. reserv.

12128311 BIOSIS NO.: 199497149596
A human amphotropic retrovirus receptor is a second member of the gibbon ape leukemia virus receptor family
AUTHOR: Van Zeijl Marja; Johann Stephen V; Closs Ellen; Cunningham James; Eddy Roger; Show Thomas B; O'Hara Bryan (Reprint)
AUTHOR ADDRESS: Mol. Biol. Res. Sect., Med. Res. Div., American Cyanamid Co., Pearl River, NY 10965, USA**USA
JOURNAL: Proceedings of the National Academy of Sciences of the United States of America 91 (3): p1168-1172 1994 1994
ISSN: 0027-8424
DOCUMENT TYPE: Article
RECORD TYPE: Abstract
LANGUAGE: English

ABSTRACT: Retrovirus infection is initiated by binding of the viral envelope glycoprotein to a cell-surface receptor. The envelope proteins of type C retroviruses of mammals demonstrate similarities in structural organization and protein sequence. These similarities suggest the possibility that retroviruses from different interference groups might use related proteins as receptors, despite the absence of any relationship between retrovirus receptors isolated to date. To investigate this possibility, we have identified a human cDNA clone encoding a protein closely related to the receptor for gibbon ape leukemia virus and have found that it functions as the receptor for the amphotropic group of murine retroviruses. Expression of this protein (%%%GLVR%%%-2) is likely to be a requirement for infection of human cells by amphotropic retroviral vectors for purposes of gene therapy.

2/7/52
DIALOG(R)File 5:Biosis Previews(R)
(c) 2008 The Thomson Corporation. All rts. reserv.

11991617 BIOSIS NO.: 199497012902
Definition of a domain of GLVR1 which is necessary for infection by gibbon ape leukemia virus and which is highly polymorphic between species
AUTHOR: Johann Stephen V; Van Zeijl Marja; Cekleniak Julie; O'Hara Bryan (Reprint)
AUTHOR ADDRESS: Mol. Biol. Res. Section, Med. Res. Div., Lederle Lab., American Cyanamid Company, Pearl River, NY 10965, USA**USA
JOURNAL: Journal of Virology 67 (11): p6733-6736 1993 1993
ISSN: 0022-538X
DOCUMENT TYPE: Article
RECORD TYPE: Abstract
LANGUAGE: English

ABSTRACT: Expression of human GLVR1 in mouse cells confers susceptibility to infection by gibbon ape leukemia virus (GALV), while the normally expressed mouse %%%Glvr%%%-1 does not. Since human and murine GLVR1 proteins differ at 64 positions in their sequences, some of the residues differing between the two proteins are critical for infection. To identify these, a series of hybrids and in vitro-constructed mutants were tested for the ability to confer susceptibility to infection. The results indicated that human GLVR1 residues 550 to 551, located in a cluster of seven of the sites that differ between the human and mouse proteins, are the only residues differing between the two which must be in the human protein form to allow infection. Sequencing of a portion of GLVR1 from

the rat (which is infectible) confirmed the importance of this cluster in that it contained the only notable differences between the rat and mouse proteins. This region, which also differs substantially between the rat and the human proteins, therefore exhibits a pronounced tendency for polymorphism.

2/7/53
DIALOG(R)File 5:Biosis Previews(R)
(c) 2008 The Thomson Corporation. All rts. reserv.

11268307 BIOSIS NO.: 199293111198
GLVR1 A RECEPTOR FOR GIBBON APE LEUKEMIA VIRUS IS HOMOLOGOUS TO A PHOSPHATE PERMEASE OF NEUROSPORA-CRASSA AND IS EXPRESSED AT HIGH LEVELS IN THE BRAIN AND THYMUS
AUTHOR: JOHANN S V (Reprint); GIBBONS J J; O'HARA B
AUTHOR ADDRESS: MOLECULAR BIOL RES SECT, AMERICAN CYANAMID COMPANY, PEARL RIVER, NEW YORK 10965, USA**USA
JOURNAL: Journal of Virology 66 (3): p1635-1640 1992
ISSN: 0022-538X
DOCUMENT TYPE: Article
RECORD TYPE: Abstract
LANGUAGE: ENGLISH

ABSTRACT: The human gene GLVR1 has been shown to render mouse cells sensitive to infection by gibbon ape leukemia virus. This indication that the GLVR1 protein acts as a virus receptor does not reveal the protein's normal physiological role. We now report that GLVR1 is homologous to pho-4+, a phosphate permease of Neurospora crassa, at a level sufficiently high to predict that GLVR1 is also a transport protein, although the substrate transported remains unknown. To characterize the gene further, we have cloned cDNA for the mouse homolog of the gen, %%%Glvr%%%-1. The sequence of the murine protein differs from that of the human protein in 10% of residues, and it may be presumed that some of these differences are responsible for the inability of gibbon ape leukemia virus to infect mouse fibroblasts. %%%Glvr%%%-1 RNA is most abundant in mouse brain and thymus, although it is present in all tissues examined. The pattern of RNA expression found in mouse tissues was also found in rat tissues, in which the RNA was expressed at high levels in all compartments of the brain except the caudate nucleus and was expressed most abundantly early in embryogenesis. Thus, high-level expression of %%%Glvr%%%-1 appears to be restricted to specific tissues and may have developmental consequences.

2/7/54
DIALOG(R)File 5:Biosis Previews(R)
(c) 2008 The Thomson Corporation. All rts. reserv.

10829784 BIOSIS NO.: 199192075555
THE MOUSE HOMOLOG OF THE GIBBON APE LEUKEMIA VIRUS RECEPTOR GENETIC MAPPING AND A POSSIBLE RECEPTOR FUNCTION IN RODENTS
AUTHOR: ADAMSON M C (Reprint); SILVER J; KOZAK C A
AUTHOR ADDRESS: LABORATORY MOLECULAR MICROBIOLOGY, NATIONAL INSTITUTE ALLERGY INFECTIOUS DISEASES, NATIONAL INSTITUTES HEALTH, BETHESDA, MD 20892, USA**USA
JOURNAL: Virology 183 (2): p778-781 1991

ISSN: 0042-6822
DOCUMENT TYPE: Article
RECORD TYPE: Abstract
LANGUAGE: ENGLISH

ABSTRACT: The mouse homolog of the Gibbon ape leukemia virus (GALV) receptor (%%%Glvr%%%-1) was mapped to mouse Chromosome 2 (Chr 2) by Southern blot analysis of somatic cell hybrids and positioned on this chromosome using an interspecies genetic cross. Mouse Chr 2 also encodes a receptor (Rec-2) for the wild mouse virus M813. To investigate whether %%%Glvr%%%- and Rec-2 could be the same gene, we sought evidence for sequence homology between the env-genes of their respective viruses. Southern blot hybridization with GALV-derived env and pol-env probes failed to detect any homology between GALV and M813, but did show that all mouse species tested carry numerous copies of GALV-related sequences. We speculate that a functional receptor for GALV-related viruses was expressed during Mus evolution.

2/7/55
DIALOG(R)File 5:Biosis Previews(R)
(c) 2008 The Thomson Corporation. All rts. reserv.

10742876 BIOSIS NO.: 199191125767
LOCALIZATION OF THE HUMAN GENE ALLOWING INFECTION BY GIBBON APE LEUKEMIA VIRUS TO HUMAN CHROMOSOME REGION 2Q11-Q14 AND TO THE HOMOLOGOUS REGION ON MOUSE CHROMOSOME 2
AUTHOR: KAELBLING M (Reprint); EDDY R; SHOWS T B; COPELAND N G; GILBERT D J ; JENKINS N A; KLINGER H P; O'HARA B
AUTHOR ADDRESS: MOLECULAR BIOLOGY RESEARCH SECTION, LEDERLE LABORATORIES, AMERICAN CYANAMID COMPANY, PEARL RIVER, NY 10965, USA**USA
JOURNAL: Journal of Virology 65 (4): p1743-1747 1991
ISSN: 0022-538X
DOCUMENT TYPE: Article
RECORD TYPE: Abstract
LANGUAGE: ENGLISH

ABSTRACT: Retrovirus receptors remain a largely unexplored group of proteins. Of the receptors which allow infection of human and murine cells by various retroviruses, only three have been identified at the molecular level. These receptors include CD4 for human immunodeficiency virus, Rec-1 for murine ecotropic virus, and GLVR1 for gibbon ape leukemia virus. These three proteins show no homology to one antoher at the DNA or protein level. Therefore, work to date has not shown any general relationship or structural theme shared by retroviral receptors. Genes for two of these receptors (CD4 and Rec-1) and several others which have not yet been cloned have been localized to specific chromosomes. In order to assess the relationship between GLVR1 and other retroviral receptors, we mapped the chromosome location of GLVR1 in human and mouse. GLVR1 was found to map to human chromosome 2q11-q14 by in situ hybridization and somatic-cell hybrid analysis. This location is distinct from those known for receptors for retroviruses infecting human cells. %%%Glvr%%%-1 was then mapped in the mouse by interspecies backcrosses and found to map to chromosome 2 in a region of linkage conservation with human chromosome 2. This mouse chromosome carries Res-2, the likely receptor for M813, a retrovirus derived from a feral Asian mouse. These data raise the interesting possibility that Rec-2 and %%%Glvr%%%-1 are

```
  structurally related.
? ds

Set     Items   Description
S1          1   (GLV OPERON)
S2         55   GLVA OR GLVR OR GLVC
S3          0   S2 AND (KNOCK)
S4          0   S2 AND REPLACE?
? s s2 and maltose
            55  S2
         12757  MALTOSE
      S5        5  S2 AND MALTOSE
? t s5/7/1-5

 5/7/1
DIALOG(R)File   5:Biosis Previews(R)
(c) 2008 The Thomson Corporation. All rts. reserv.

0019899363   BIOSIS NO.: 200700559104
Mechanism of %%%GlvA%%% from Bacillus subtilis: A detailed kinetic analysis
  of a 6-phospho-alpha-glucosidase from glycoside hydrolase family 4
AUTHOR: Yip Vivian L Y; Thompson John; Withers Stephen G (Reprint)
AUTHOR ADDRESS: Univ British Columbia, Dept Chem, 2036 Main Mall,
  Vancouver, BC V6T 1Z1, Canada**Canada
AUTHOR E-MAIL ADDRESS: withers@chem.ubc.ca
JOURNAL: Biochemistry  46 (34): p9840-9852 AUG 28 2007 2007
ITEM IDENTIFIER: doi:10.1021/bi700536p
ISSN: 0006-2960
DOCUMENT TYPE: Article
RECORD TYPE: Abstract
LANGUAGE: English

ABSTRACT: %%%GlvA%%%, a 6-phospho-alpha-glucosidase from Bacillus subtilis
  assigned to glycoside hydrolase family 4, catalyzes the hydrolysis of
  %%%maltose%%% 6'-phosphate via a redox-elimination-addition mechanism
  requiring NAD(+) as cofactor. In contrast to previous reports and
  consistent with the proposed mechanism, %%%GlvA%%% is only activated in
  the presence of the nicotinamide cofactor in its oxidized, and not the
  reduced NADH, form. Significantly, %%%GlvA%%% catalyzes the hydrolysis of
  both 6-phospho-alpha- and 6-phospho-beta-glucosides containing activated
  leaving groups such as p-nitrophenol and does so with retention and
  inversion, respectively, of anomeric configuration. Mechanistic details
  of the individual bond cleaving and forming steps were probed using a
  series of 6-phospho-alpha- and 6-phospho-beta-glucosides. Primary
  deuterium kinetic isotope effects (KIEs) were measured for both classes
  of substrates in which either the C2 or the C3 protons have been
  substituted with a deuterium, consistent with C-H bond cleavage at each
  center being partially rate-limiting. Kinetic parameters were also
  determined for 1-[H-2]-substituted substrates, and depending on the
  substrates and the reaction conditions, the measurements of k(cat) and
  k(cat)/K-M produced either no KIEs or inverse KIEs. In conjunction with
  results of Bronsted analyses with both aryl 6-phospho-alpha- and
  beta-glucosides, the kinetic data suggest that %%%GlvA%%% utilizes an
  E1(cb) mechanism analogous to that proposed for the Thermotoga maritima
  BglT, a 6-phospho-beta-glucosidase in glycoside hydrolase family 4 (Yip,
  V.L.Y et al. (2006) Biochemistry 45, 571-580). The pattern of isotope
  effects measured and the observation of very similar k(cat) values for
```

all substrates, including unactivated and natural substrates, indicate that the oxidation and deprotonation steps are rate-limiting steps in essentially all cases. This mechanism permits the cleavage of both alpha- and beta-glycosides within the same active site motif and, for activated substrates that do not require acid catalysis for cleavage, within the same active site, yielding the product sugar-6-phosphate in the same anomeric form in the two cases.

5/7/2
DIALOG(R)File 5:Biosis Previews(R)
(c) 2008 The Thomson Corporation. All rts. reserv.

19125200 BIOSIS NO.: 200600470595
%%%Maltose%%% and maltodextrin utilization by Bacillus subtilis
AUTHOR: Schoenert Stefan (Reprint); Seitz Sabine; Krafft Holger; Feuerbaum Eva-Anne; Andernach Iris; Witz Gabriele; Dahl Michael K
AUTHOR ADDRESS: Univ Konstanz, Fachbereich Biol, Lehrstuhl Mikrobiol, Univ Str 10,M605, D-78457 Constance, Germany**Germany
AUTHOR E-MAIL ADDRESS: stefan.schoenert@gmx.de
JOURNAL: Journal of Bacteriology 188 (11): p3911-3922 JUN 2006 2006
ISSN: 0021-9193
DOCUMENT TYPE: Article
RECORD TYPE: Abstract
LANGUAGE: English

ABSTRACT: Bacillus subtilis can utilize %%%maltose%%% and maltodextrins that are derived from polysaccharides, like starch or glycogen. In this work, we show that %%%maltose%%% is taken up by a member of the phosphoenolpyruvate-dependent phosphotransferase system and maltodextrins are taken up by a maltodextrin-specific ABC transporter. Uptake of %%%maltose%%% by the phosphoenolpyruvate-dependent phosphotransferase system is mediated by %%%maltose%%%-specific enzyme IICB (MaIP; synonym, %%%GlvC%%%), with an apparent K-m of 5 mu M and a V-max of 91 nmol (.) min(-1) (.) (10(10) CFU)(-1). The maltodextrin-specific ABC transporter is composed of the maltodextrin binding protein MdxE (formerly YvdG), with affinities in the low micromolar range for maltodextrins, and the membrane-spanning components MdxF and MdxG (formerly YvdH and YvdI, respectively), as well as the energizing ATPase MsmX. Maltotriose transport occurs with an apparent K-m of 1.4 mu M and a V-max of 4.7 nmol (.) min(-1) (10(10) CFU)(-1).

5/7/3
DIALOG(R)File 5:Biosis Previews(R)
(c) 2008 The Thomson Corporation. All rts. reserv.

16249024 BIOSIS NO.: 200100420863
Regulation of the glv operon in Bacillus subtilis: YfiA (%%%GlvR%%%) is a positive regulator of the operon that is repressed through CcpA and cre
AUTHOR: Yamamoto Hiroki; Serizawa Masakuni; Thompson John; Sekiguchi Junichi (Reprint)
AUTHOR ADDRESS: Department of Applied Biology, Faculty of Textile Science and Technology, Shinshu University, 3-15-1 Tokida, Ueda-shi, Nagano, 386-8567, Japan**Japan
JOURNAL: Journal of Bacteriology 183 (17): p5110-5121 September, 2001 2001
MEDIUM: print

ISSN: 0021-9193
DOCUMENT TYPE: Article
RECORD TYPE: Abstract
LANGUAGE: English

ABSTRACT: %%%Maltose%%% metabolism and the regulation of the glv operon of Bacillus subtilis, comprising three genes, %%%glvA%%% (6-phospho-alpha-glucosidase), yfiA (now designated %%%glvR%%%), and %%%glvC%%% (EIICB transport protein), were investigated. %%%Maltose%%% dissimilation was dependent primarily upon the glv operon, and insertional inactivation of either %%%glvA%%%, %%%glvR%%%, or %%%glvC%%% markedly inhibited growth on the disaccharide. A second system (MaIL) contributed to a minor extent to %%%maltose%%% metabolism. Northern blotting revealed two transcripts corresponding to a monocistronic mRNA of %%%glvA%%% and a polycistronic mRNA of %%%glvA%%%-%%%glvR%%%-%%%glvC%%%. Primer extension analysis showed that both transcripts started at the same base (G) located 26 bp upstream of the 5' end of %%%glvA%%%. When %%%glvR%%% was placed under control of the spac promoter, expression of the glv operon was dependent upon the presence of isopropyl-beta-D-thiogalactopyranoside (IPTG). In regulatory studies, the promoter sequence of the glv operon was fused to lacZ and inserted into the amyE locus, and the resultant strain (AMGLV) was then transformed with a citrate-controlled %%%glvR%%% plasmid, pHYCM2VR. When cultured in Difco sporulation medium containing citrate, this transformant (AMGLV(pHYCM2VR)) expressed LacZ activity, but synthesis of LacZ was repressed by glucose. In an isogenic strain, (AMGLVCR(pHYCM2VR)), except for a mutation in the sequence of a catabolite-responsive element (cre), LacZ activity was expressed in the presence of citrate and glucose. Insertion of a citrate-controlled %%%glvR%%% plasmid at the amyE locus of ccpA+ and ccpA mutant organisms yielded strains AMCMVR and AMCMVRCC, respectively. In the presence of both glucose and citrate, AMCMVR failed to express the glv operon, whereas under the same conditions high-level expression of both mRNA transcripts was found in strain AMCMVRCC. Collectively, our findings suggest that %%%GlvR%%% (the product of the %%%glvR%%% gene) is a positive regulator of the glv operon and that glucose exerts its effect via catabolite repression requiring both CcpA and cre.

5/7/4
DIALOG(R)File 5:Biosis Previews(R)
(c) 2008 The Thomson Corporation. All rts. reserv.

15057878 BIOSIS NO.: 199900317538
Crystallization and preliminary X-ray analysis of the 6-phospho-alpha-glucosidase from Bacillus subtilis
AUTHOR: Varrot Annabelle; Yamamoto Hiroki; Sekiguchi Junichi; Thompson John ; Davies Gideon J (Reprint)
AUTHOR ADDRESS: Department of Chemistry, University of York, Heslington, York, YO10 5DD, UK**UK
JOURNAL: Acta Crystallographica Section D Biological Crystallography 55 (6): p1212-1214 June, 1999 1999
MEDIUM: print
ISSN: 0907-4449
DOCUMENT TYPE: Article
RECORD TYPE: Abstract
LANGUAGE: English

ABSTRACT: 6-Phospho-alpha-glucosidase (%%%GlvA%%%) is the protein involved in the dissimilation of alpha-glycosides accumulated via a phosphoenolpyruvate-dependent %%%maltose%%% phosphotransferase system (PEP-PTS) in Bacillus subtilis. The purified enzyme has been crystallized in a form suitable for X-ray diffraction analysis. Thin rod-like crystals have been grown by the hanging-drop method in the presence of manganese and NAD. They diffract beyond 2.2 ANG using synchrotron radiation and belong to the space group I222 (or its enantiomorph) with unit-cell dimensions a = 83.26, b = 102.56, c = 145.31 ANG and contain a single molecule of %%%GlvA%%% in the asymmetric unit.

5/7/5
DIALOG(R)File 5:Biosis Previews(R)
(c) 2008 The Thomson Corporation. All rts. reserv.

14696649 BIOSIS NO.: 199800490896
The gene %%%glvA%%% of Bacillus subtilis 168 encodes a metal-requiring, NAD(H)-dependent 6-phospho-alpha-glucosidase: Assignment to family 4 of the glycosylhydrolase superfamily
AUTHOR: Thompson John (Reprint); Pikis Andreas; Ruvinov Sergei B; Henrissat Bernard; Yamamoto Hiroki; Sekiguchi Junichi
AUTHOR ADDRESS: NIDR Natl. Inst. Health, Build. 30 Room 528, Convent Dr., MSC-4350, Bethesda, MD 20892, USA**USA
JOURNAL: Journal of Biological Chemistry 273 (42): p27347-27356 Oct. 16, 1998 1998
MEDIUM: print
ISSN: 0021-9258
DOCUMENT TYPE: Article
RECORD TYPE: Abstract
LANGUAGE: English

ABSTRACT: The gene %%%glvA%%% (formerly glv-1) from Bacillus subtilis has been cloned and expressed in Escherichia coli. The purified protein %%%GlvA%%% (449 residues, Mr = 50,513) is a unique 6-phosphoryl-O-alpha-D-glucopyranosyl:phosphoglucohydrolase (6-phospho-alpha-glucosidase) that requires both NAD(H) and divalent metal (Mn2+, Fe2+, Co2+ or Ni2+) for activity. 6-Phospho-alpha-glucosidase (EC 3.2.1.122) from B. subtilis cross-reacts with polyclonal antibody to %%%maltose%%% 6-phosphate hydrolase from Fusobactergum mortiferum, and the two proteins exhibit amino acid sequence identity of 73%. Estimates for the Mr of %%%GlvA%%% determined by SDS-polyacrylamide gel electrophoresis (51,000) and electrospray-mass spectroscopy (50,510) were in excellent agreement with the molecular weight of 50,513 deduced from the amino acid sequence. The sequence of the first 37 residues from the N terminus determined by automated analysis agreed precisely with that predicted by translation of %%%glvA%%%. The chromogenic and fluorogenic substrates, p-nitrophenyl-alpha-D-glucopyranoside 6-phosphate and 4-methylumbelliferyl-alphaD-glucopyranoside 6-phosphate were used for the discontinuous assay and in situ detection of enzyme activity, respectively. Site-directed mutagenesis shows that three acidic residues, Asp41, Glu111, and Glu359, are required for %%%GlvA%%% activity. Asp41 is located at the C terminus of a betaalphabeta fold that may constitute the dinucleotide binding domain of the protein. Glu111 and Glu359 may function as the catalytic acid (proton donor) and nucleophile (base),

```
  respectively, during hydrolysis of 6-phospho-alpha-glucoside substrates
  including %%%maltose%%% 6-phosphate and trehalose 6-phosphate. In
  metal-free buffer, %%%GlvA%%% exists as an inactive dimer, but in the
  presence of Mn2+ ion, these species associate to form the
  NAD(H)-dependent catalytically active tetramer. By comparative sequence
  alignment with its homologs, the novel 6-phospho-alpha-glucosidase from
  R. subtilis can be assigned to the nine-member family 4 of the
  glycosylhydrolase superfamily.
? ds

Set     Items   Description
S1          1   (GLV OPERON)
S2         55   GLVA OR GLVR OR GLVC
S3          0   S2 AND (KNOCK)
S4          0   S2 AND REPLACE?
S5          5   S2 AND MALTOSE
? log y
       04mar08 13:47:36 User217744 Session D1115.3
            $9.84    1.590 DialUnits File5
             $146.40  60 Type(s) in Format  7
          $146.40  60 Types
   $156.24  Estimated cost File5
     $1.60  TELNET
   $157.84  Estimated cost this search
   $157.86  Estimated total session cost   1.978 DialUnits
Logoff: level 05.21.01 D  13:47:36
```